



PROGRESS

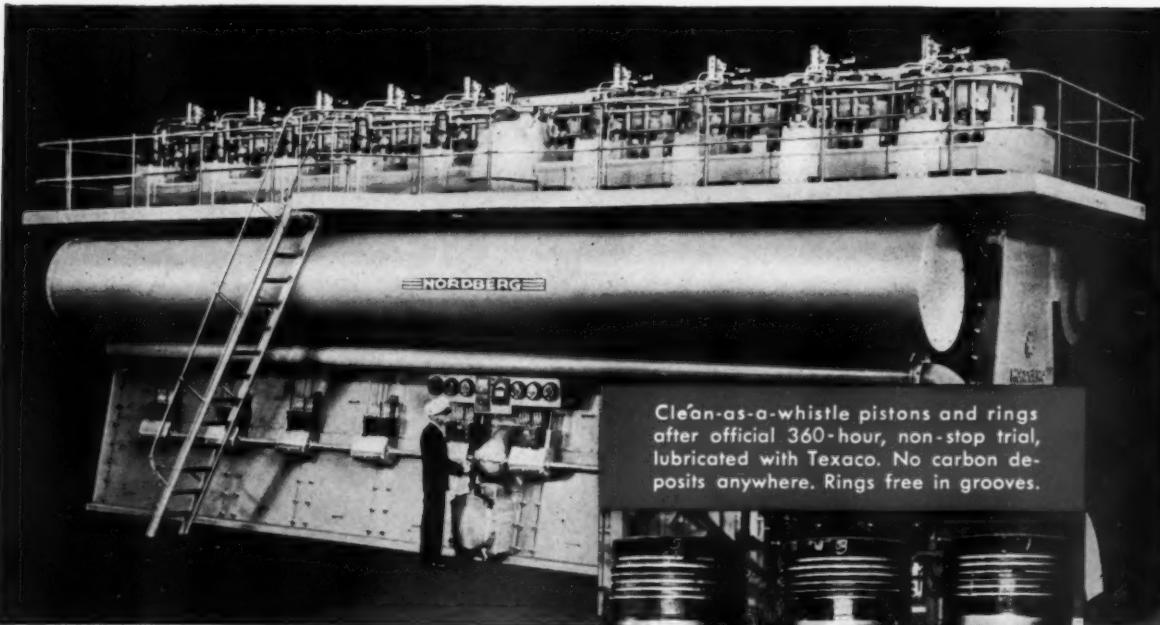
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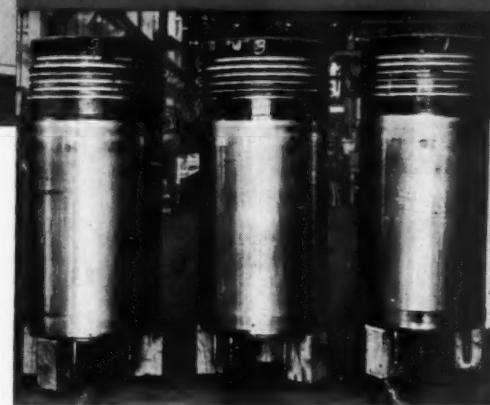


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TEXACO Lubricants and Fuels FOR ALL DIESEL ENGINES

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

DIESEL PROGRESS, for May, 1945. Volume XI, Number 5. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 West Forty-fifth St., New York 19, N. Y. Rex W. Wadman, President. Acceptance under the Act of June 5, 1943, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: \$5.00 per year, single copy, 50¢.

REX W. WADMAN
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FRONT COVER ILLUSTRATION: Scene in the Feather River Canyon near Pulga, California, on the Western Pacific R. R. This is a 4-unit General Motors Diesel-electric locomotive handling a 4000-ton freight train over heavy grades.

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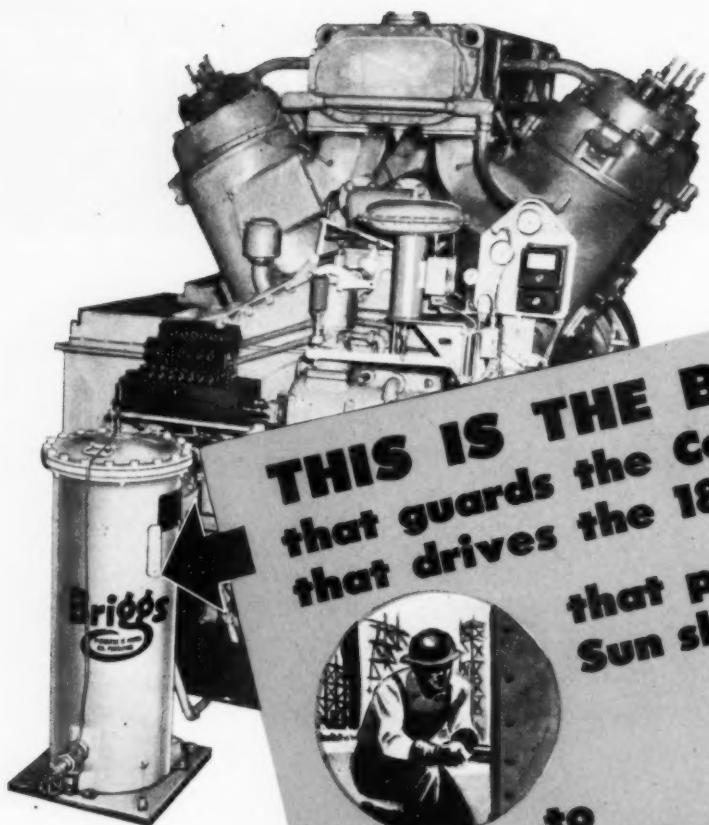
DIESEL and GAS ENGINE PROGRESS



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For over 18 months this Briggs Lube Oil Clarifier has protected this most important piece of equipment at the Sun Shipbuilding and Drydock Company, Chester, Pa.

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Wherever equipment breakdown would interrupt production—**THERE'S THE PLACE TO INSTALL A BRIGGS OIL CLARIFIER!**

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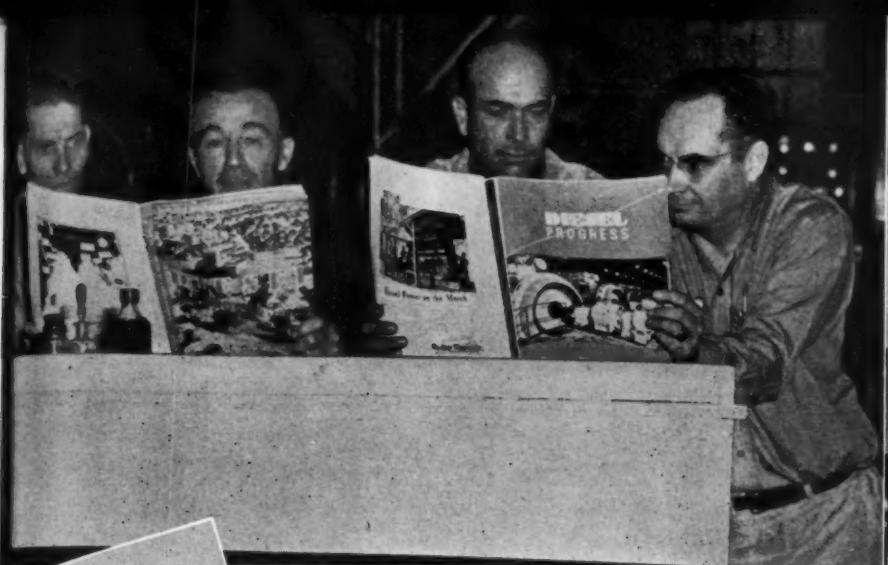
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Of this view the author says, "Our boys enjoy the many interesting and worthwhile articles in DIESEL PROGRESS."



Lin B. Orme, president of Salt River Valley Water Users Association since 1934.

H. J. Lawson, General Superintendent and Chief Engineer of the Association.



The author at his desk in the Cross Cut plant of the Salt River Project.

THE SALT RIVER PROJECT

By CLYDE R. WILLIAMS *

A GREAT deal of water has gone over the dams, so to speak, since the Salt River Project was originally described in the August 1938 issue of DIESEL PROGRESS. The second big Hamilton Diesel has been added to the standby plant and we have accumulated a vast and satisfactory operating experience which will be outlined in this article. But first a brief review of the history of this, one of the earliest reclamation projects undertaken by the Federal Government.

The Salt River Project, covering the major portion of the Salt River Valley, is situated in South Central Arizona. The valley is about 20 miles wide and 50 miles long, with moun-

* Superintendent, Cross Cut Power Plant.

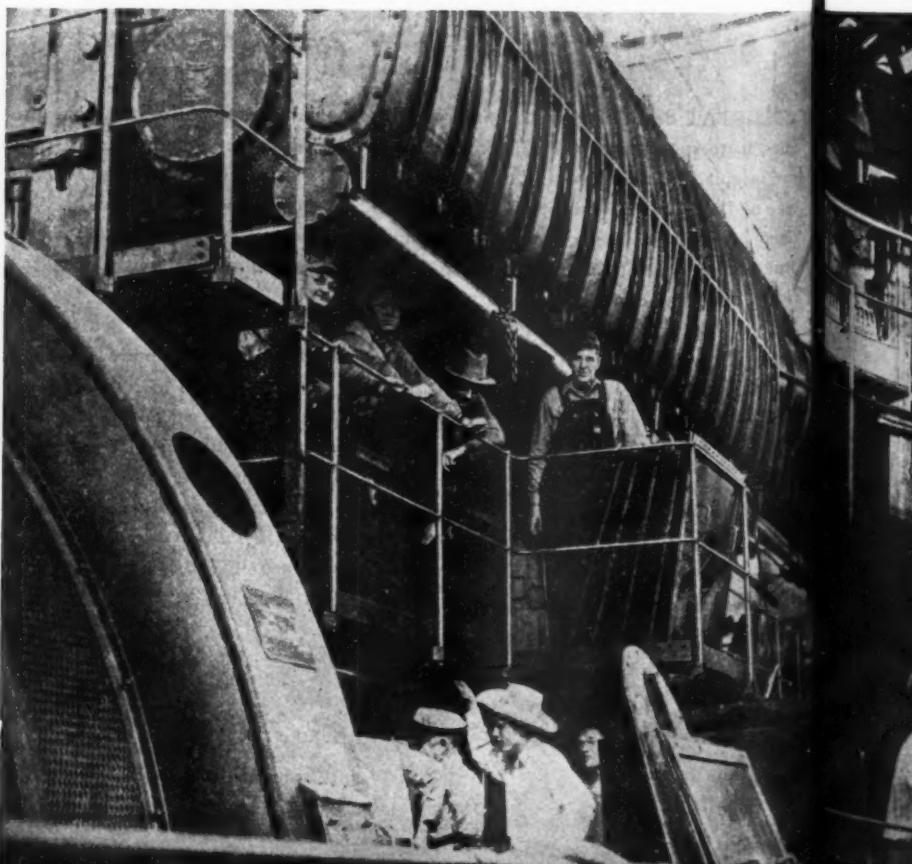
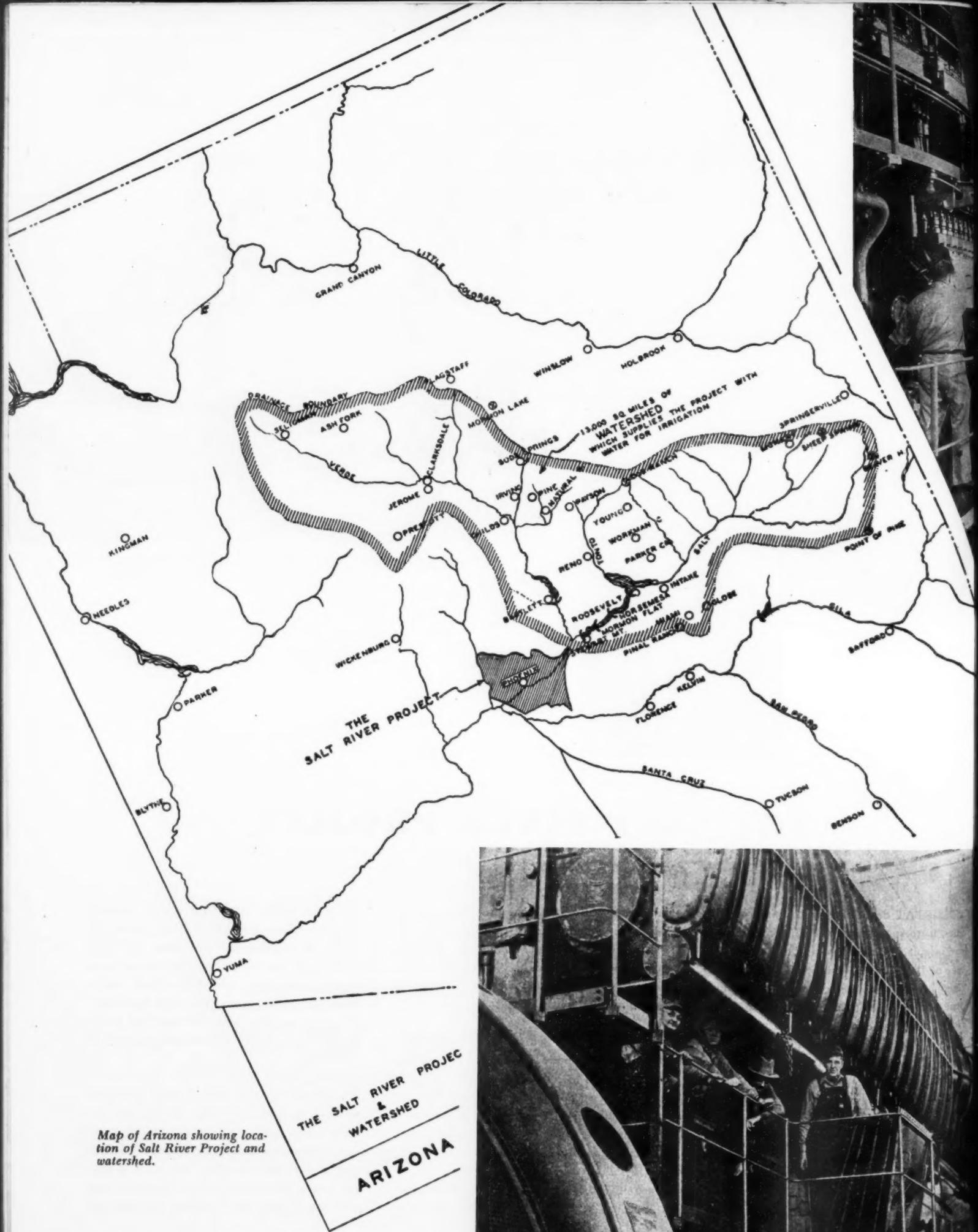
tains rising abruptly from the plains on all sides. The annual rainfall varies from 3 to 20 inches, with an average of 7 inches. The high percentage of sunshine (84%) gives this valley the sobriquet, "Valley Of The Sun." Farming is carried out the year 'round.

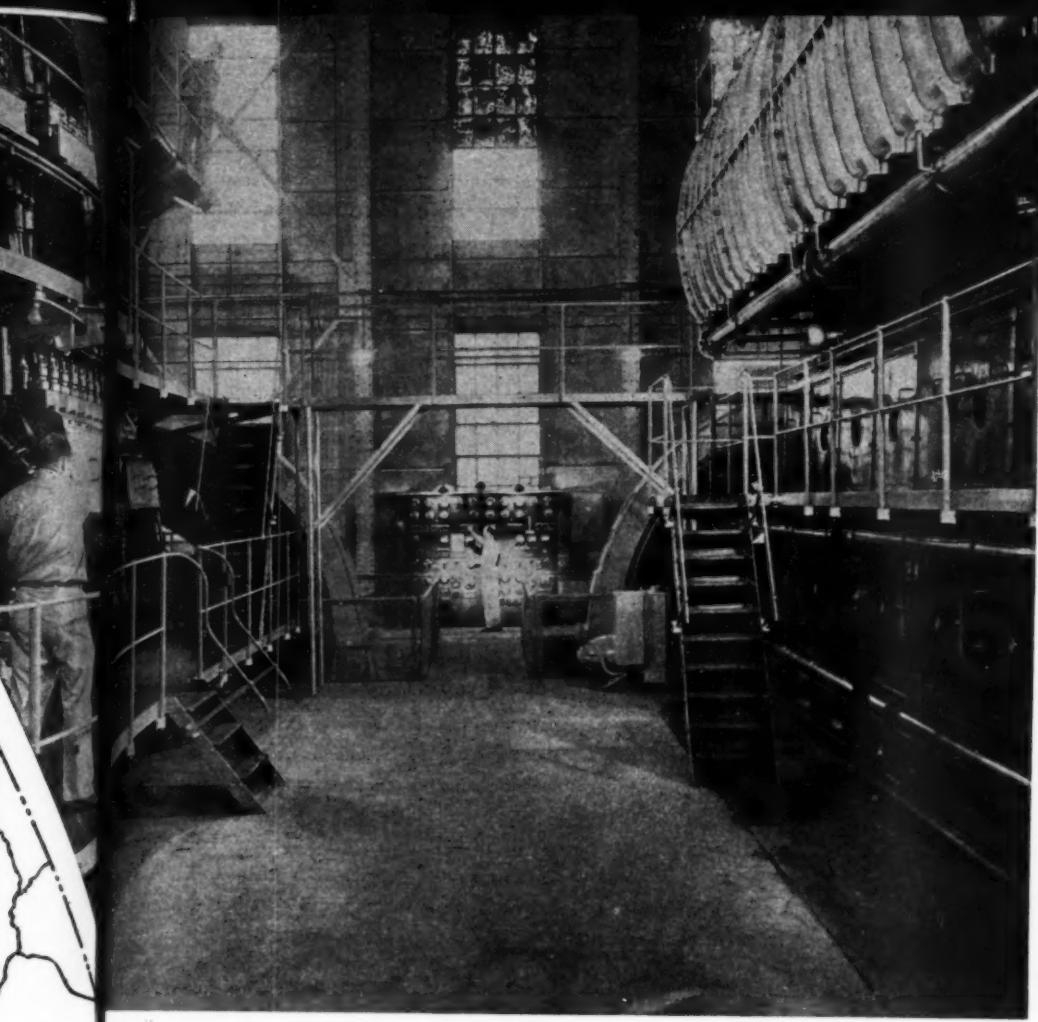
Irrigation by white settlers began about 1867. River flow was, however, erratic, varying from a small stream to enormous floods. The supply at low river stage was inadequate for the land in cultivation and flows in excess of immediate needs or canal capacities were lost, due to lack of storage facilities.

Since 1917 the Salt Valley Water Users Association has constructed and put into operation

the Horse Mesa, Mormon Flat, and Stewart Mountain Dams and hydro-electric plants on the Salt River below Roosevelt Dam. The Cave Creek flood control Dam and the Barlett Dam on the Verde River have been added, also a steam and Diesel plant. The eight hydro-electric plants, together with the steam and Diesel plants have a combined generating capacity of 157,500 hp.

The investment in irrigation, power and other works, is around \$43,000,000. Besides the five large storage dams, there are three major diversion dams, 1,400 miles of canals and laterals with over 10,000 structures, 1,850 miles of electric power lines with 27 substations, two large warehouses, three office buildings, over 100 resi-





With an eye on the system frequency the engineer at the switchboard signals to start the 7000 hp. double acting Hamilton Diesels. These two Hamilton Diesels stand ready to restore service during system interruptions and to handle peak loads.

Below, left: Scene during the annual Spring inspection and overhaul of the big Hamilton Diesels. Below: Grouped on three levels of the Diesel is a class training in plant operation and procedure.



dences and 200 pumping plants. The project employs from 700 to 1000 people. So much for the general background.

At the Cross Cut Power Plant we have worked out a unique combination of steam, Diesel and Hydro prime movers linked up with frequency conversion. This station has both 25 and 60 cycle generating units, each performing a definite function in coordination with the power system demands. In fact this plant enjoys the distinction of being the only one in this country, if not the world, possessing this combination of power sources.

With the aid of C. C. Moore & Co., engineers, we have combined the various prime movers so they can be operated by one common operating organization. Waste heat has been utilized to generate steam from the exhausts of the two 7000 hp. Diesels. Cooling water for steam condensing has been used from the Hydro system and again developing power with the same water before returning it to the irrigating canals. Many schemes are being successfully and profitably used to utilize the various sources of heat and power.

The two big 7000 hp., double acting Diesels stand by to come on the line in the event the frequency drops 0.2 cycle below normal. These Diesels and their attendants perform almost miracles at times in restoring immediate service during system power interruptions resulting mostly from electrical storms. Another important and economical function of the large Diesels is their ability to quickly get on the line and push the system over the peak, as well as to regulate the system frequency.

The plant is located in a desert country, hot, dry and dusty, which presents three major correlated problems of heat transmission effecting the operation and maintenance of the power plant. They are the filtering and purification of water, air, and oil.

Thousands of gallons of water are circulated per minute through the system of the steam and Diesel units when they are in operation. The make-up water for these systems came originally (and still does in cases of emergency) from two separate sources of wells. Both well water sources contain hard scale-forming mineral salts requiring chemical treatment. Therefore on the make-up water for the steam plant boilers and the engine waste-heat boilers, it was found necessary to install Zeolite softeners ahead of the evaporators. This method of scale prevention is satisfactory, and costs in line comparable to other plants in this vicinity, but

expensive at best because of blow-down.

After several months of experiment and tests, the canal water from our Hydro plant was found to average much lower in temperature than in our cooling towers, and sufficiently low in scale forming mineral salts to require very little water softening and none at times. By installing ordinary sand filters for the canal water and using it in the Zeolite softeners, and by placing the evaporators in series we have reduced expensive boiler blow-down to zero. By effecting clean surfaces in the engine heat exchangers, cylinder liners and pistons, the savings run into substantial sums.

By using cold soft canal water in the Diesel engine heat exchangers and the steam turbine surface condensers, both plants are able to carry their full loads with maximum economy during the hot summer months, thereby saving thousands of dollars per month in the fuel costs. After the canal water has been through the Hydro plant generating power, it is then pumped through the engine heat exchangers and the surface condensers of the steam units. Since there is some 43 foot drop from the steam

and Diesel units down to the canal, a water-wheel driven generator was installed in the water pipe line to generate power with the same water. This water-wheel generator recovers 70% of the energy required to pump the cold water through the system.

The air in this desert country is hot, dry, and the dust contains considerable abrasives. Engine cylinder liner and ring wear have been substantially reduced by installing air washers ahead of the mechanical filters on the scavenging blowers. Air filters have been installed throughout the plant.

The lubricating and fuel oil problem has been one of the most stubborn diseases that we have had to work with. The worst offender has been the engine crankcase oils, and the next was the economic recovery of leakage oils and from frequent bearing oil changes throughout the plant. Oil purifiers have been added to all fuel and lubricating oils used in this station.

The normal life of efficient and economical service of every piece of power plant equipment can be extended to surprising ages, by properly

conditioning the water, the air, and the oil that it uses. They are critically co-related. For instance, the engine liner can survive longer if, first, the scavenging air is free of abrasive substances; second, the lubricating oil is free of contaminants; third, soft non-scale forming water to provide immediate transfer of unused heat from the engine to the water for removal. If any one of the three is neglected the other two become seriously ineffective with the loss of efficiency and eventual failure of the liner. Thousands of dollars a year are saved in lube oil and maintenance costs by properly cleaning oil, correct lubrication, recovery of leakage and frequent changes of oil. A simple but effective system of reclaiming ordinarily discarded oils has been worked out wherein the oil flows by gravity through two vertical steam heated cylinders. The first of these cylinders receives the dirty oil into a cotton waste packed basket where most of the heavy particles are caught, thence through a 100 mesh wire screen into a 4 in. pipe leading to the bottom of a precipitation chamber fitted with a steam coil. The oil flows upward through this chamber, (this method has proven more effective than downward flow for separation of solids), and out near the top of the cylinder. This process is repeated in the second cylinder from which the oil enters a steam heated storage tank. On leaving the storage tank the oil is pumped through a 200 mesh screen and then through a Honan-Crane purifier into the clear oil make-up tank for the engine systems. Following is a before and after analysis of our oil.

	Before Purification	After Purification
Viscosity, Saybolt Univ. Sec.		
@ 100°F.	582	535
@ 130°F.	243	239
@ 210°F.	64.0	62.0
Carbon Residue, %	0.74	0.45
Water & Sediment, %	1.50	0.05
Flash Point, Deg. F.	370	400
Fire Point, Deg. F.	440	455
Acid Neut. No.; mg KOH	0.40	0.23

Editor's note: We feel our Readers will appreciate the splendid inside story of the Cross Cut Power Plant of the Salt River Valley Project which Clyde Williams has so painstakingly prepared. But it seems to us that something more than operating skill makes this highly complex organization of men and machinery tick—something that is expressed in the author's year-end fighting letter to his President, which has come to our hand and which we take the liberty of reproducing here.

The Diesel plant equipment, which by the way is giving such good account of itself, consists in the main, in addition to the two 7000 hp. 8-cylinder, double acting Hamilton Diesels and their direct connected 6,250 kva., 6,600 V., 25-cycle General Electric generators, of a large Fluor aerator cooling tower, a battery of 24 Air-Maze unit type air filters serving the Allis-Chalmers scavenging blower and three Maxim exhaust silencers. All fuel oil is centrifuged in a Sharples machine and passed through the Bassler meter. The engines are fitted with Manzel cylinder lubricators and Woodward isochronous governors.

Salt River Valley Water Users' Association

C O P Y

OPERATING SALT RIVER PROJECT
UNDER NATIONAL RECLAMATION ACT
FOR
UNITED STATES AND SALT RIVER PROJECT AGRICULTURAL IMPROVEMENT AND POWER DISTRICT
WATER USERS' BUILDING
PHOENIX, ARIZONA

December 28, 1944

Mr. Lin Orme, President,
Salt River Valley Water Users Assn.,
Phoenix, Arizona

Dear Mr. Orme:

It is my good fortune to convey to our Association the following message of assurance: That the Cross Cut Power Plant employees have gone ALL OUT FOR EISENHOWER and are resolved that —

Let no man misunderstand, much less Hitler and his bunch of cutthroats, the grim and determined will of an American working man when the going gets tough. The tougher the going the tougher we get, both over there and on the home front. We expected rough days and that is why Uncle Sam sent Dwight D. Eisenhower, one of our smartest and toughest soldiers over there to get the job done. He and his boys can take it -- take anything the damned Axis has to offer; but don't forget we just said that he was a smart warrior. He is saving that famous American paralyzing punch; the punch backed up by millions of determined American men and women.

Mr. Orme, as this little group of men in this power plant tighten their belts and roll up their sleeves, they are united as one, and inseparable in their determination to keep our end of the power available at all times—power that keeps the war plants moving, with sections of planes and other materials and devices rolling steadily off the production lines. Power for our mines, where beneath the earth's surface armies of miners are toiling to produce the copper and lead and other metals needed for Eisenhower's arms. Power to our huge agricultural empire of the Salt River Valley, bulwarked by irrigation, and a partner of the great livestock industry, producing food and other products for the armed forces.

And, yes, power for the airfields, where hundreds of our youths are trying their wings and their plane motors roaring full-throated defiance to the Axis and all it stands for.

We are 100 per cent further resolved—with the singleness of purpose to the one great aim of helping to push Eisenhower into Berlin-- and MacArthur into Tokyo. And not until that day will we relax or take our eyes or thoughts off our jobs.

Respectfully submitted,
Clyde R. Williams
CLYDE R. WILLIAMS,
Plant Superintendent

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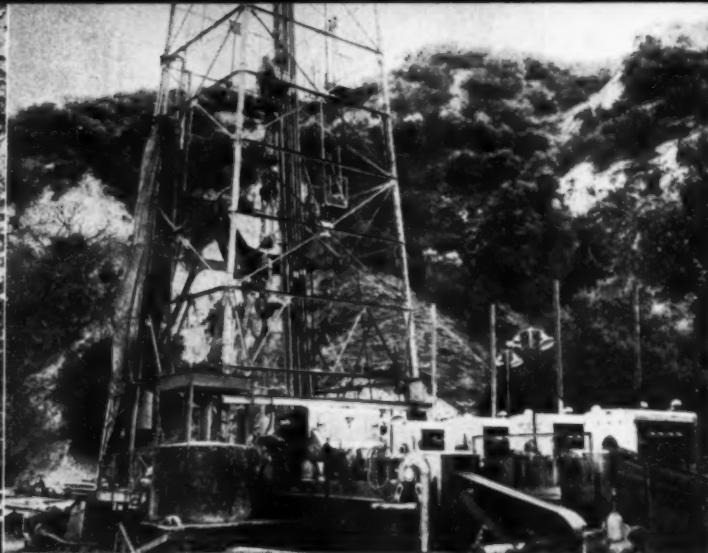
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Caterpillar Diesel tractors equipped with Trackson pipe layers place sections over the trench for welding. Diesel-dozers fill in after the pipe has been lowered.

Placing oil pipe line sections from a Caterpillar Diesel tractor fitted with a special elevator.



Four Caterpillar Diesels drive this modern steel rig.

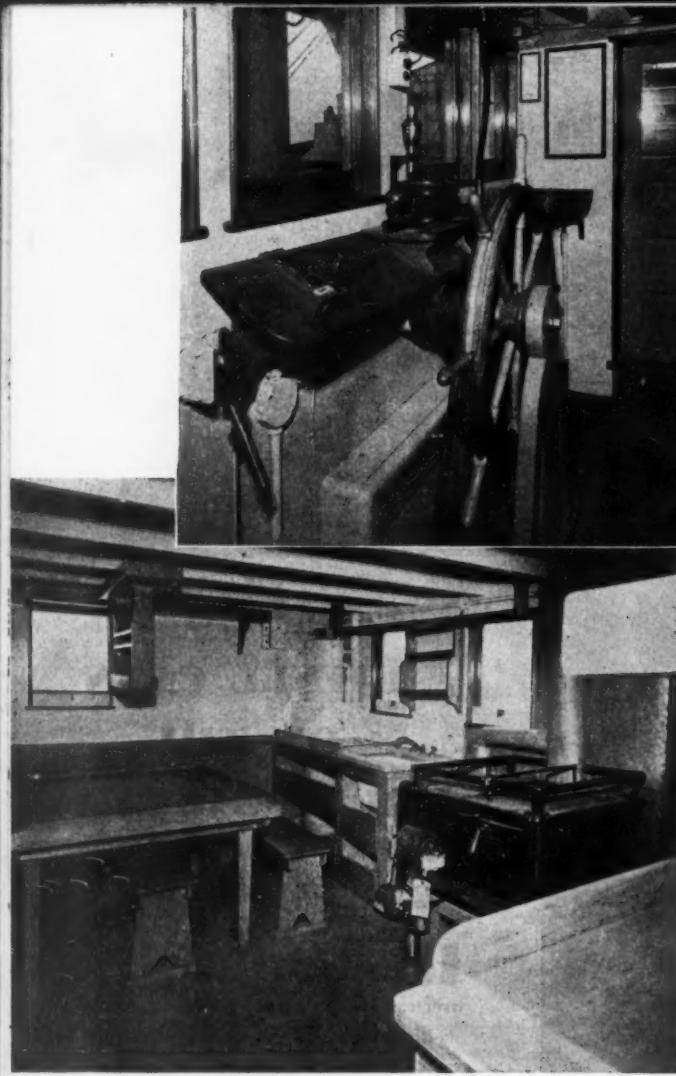
DIESEL CATS ON THE GREAT OIL WAY

By JIM MEDFORD

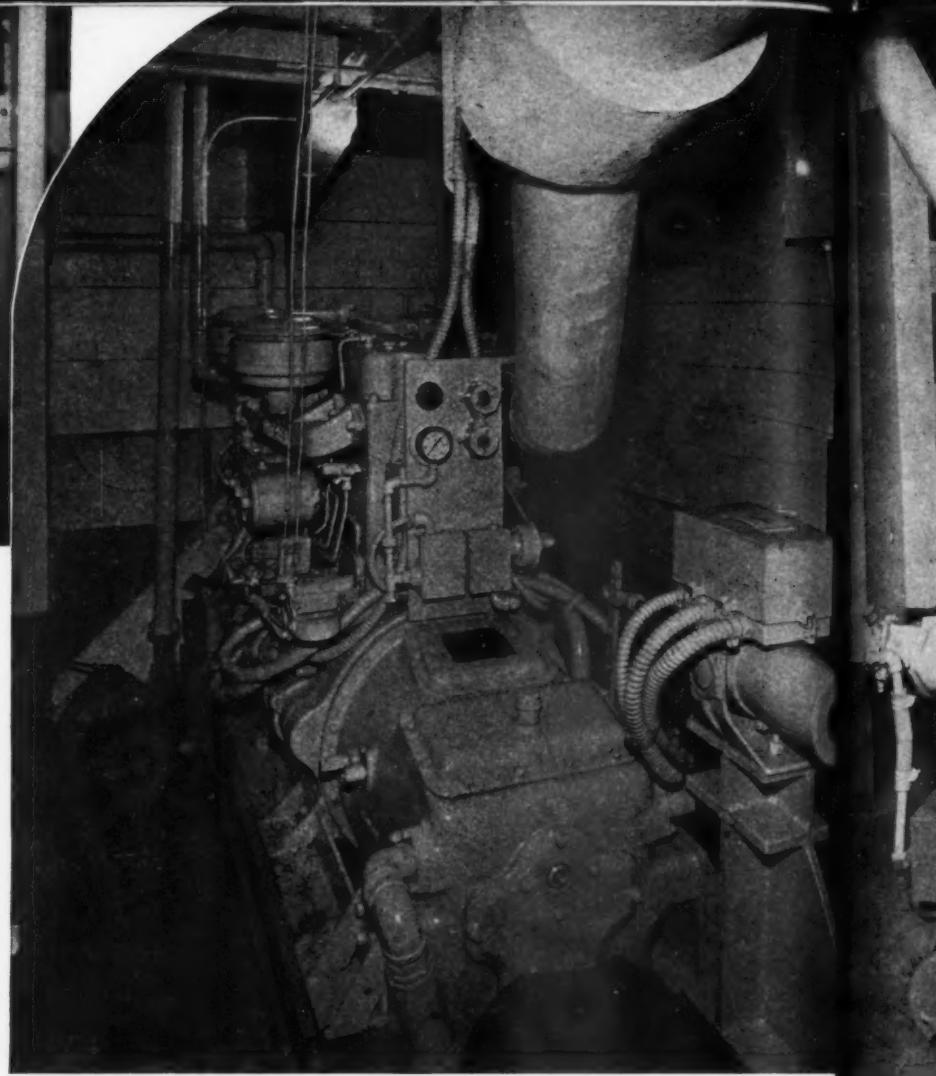
HALF of the supplies shipped to our army overseas are petroleum products. On a single six-hour flight, 1000 four-motored army bombers, on the average, use 1,850,000 gallons of fuel. To go 100 miles, one armored tank division needs 25,000 gallons of gasoline. And before pilots go overseas, 12,000 gallons of high octane gasoline are consumed in each pilot's training. Behind all this is the production line, the great oil way that begins with the locating of the site for the drilling rig and leads through the pipe transmission line to storage, refinery and tide-water loading points.

From spudding-in to production, road building and pipe laying, the Diesel Cat grunts and roars to the tune of the rotary table's rhythm, the dozer's efforts and the side-boom's pipe-positioning struggles. This dependable power at low cost with flexibility and the stamina to take it through continuous shifts turned the petroleum industry into a hibernating bear—living off its own fat.





Wheelhouse and galley on the Army Power Barges.



The main propulsion units are Buda-Lanova, 150 hp. Diesels—one shown.

Auxiliary u

By CHARLES F. A. MANN

AGAIN showing some practical horse sense when it comes to building up its vast fleet of Diesel vessels, the Army comes forward with an ingenious application of a Pacific Northwest-invented ship type, in its fleet of new self propelled power barges for use in the remote outposts of Western Alaska, including the Aleutians. Swift moving events however, have stymied full realization of the dream of having a fleet of about 100 of these queer looking Diesel barges, and it is now not definite that even half of the order will be completed.

To Pacific Boat Building Company at Tacoma goes credit for another marine Diesel "first," the completion and delivery in January of the *BSP 3131* humble "name" for the first of the large fleet ordered, then cut back, from a dozen North Pacific boatyards.

Borrowing almost intact the idea first used by

Alaska fishing people, the design is actually a modified heavier built power fishing barge, of the type used to haul live fish from traps to the cannery. Some use them as plain cannery tenders to carry fish from various small seiners to the cannery for unloading while the seiners remain in the vicinity of the big catches for another haul.

The Army wanted a combination husky old barge—a plain flat barge, plus carrying capacity for fuel oil below, in large tanks, and a roomy deck space to lighter freight from deepwater cargo-supply ships to the innumerable shallow harbors that dot thousands of miles of Alaska coastline. So it chose the power barge type, lock stock and barrel practically a copy of the same thing that has worked so well in the fishing industry for many years.

Twin small Diesel engines, and a farm-type electric generating plant, comprise the machinery, plus the usual three pieces of deck machinery, lineshaft-driven off the main propulsion engines.

The hull is a big, roomy barge, with stubby rounded bow, square stern and constructed to withstand a terrific overload, much bouncing on rocky beaches, and with double skegs so if Alaska's swift, long tides run out and leave them high and dry while unloading they'll sit flat on the beach and the hull won't warp or bend. Only a lightweight, compact, low head Diesel plant would work out here, and only a Diesel would be permitted in a wooden barge for safety reasons.

Overall dimensions are 88 x 24 x 9 ft. draft aft, loaded, and 5 ft. draft forward, also loaded. They are of heaviest fir construction with solid longitudinal bulkheads to give them terrific strength, and are heavily planked.

Atop is a small deckhouse with crew's quarters and galley and above the pilot house area with more crew's quarters and two lifeboats and gun mount atop.

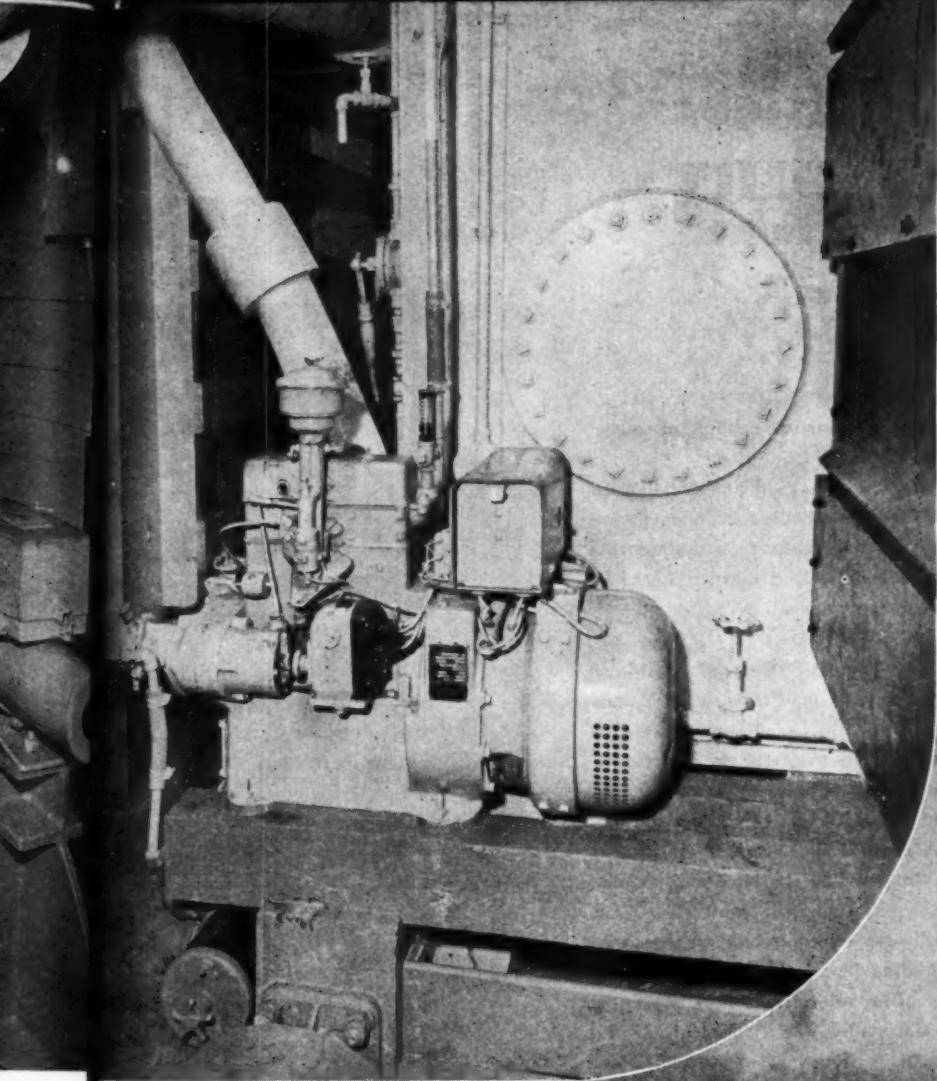
Pacific Boat won the distinction of being first to finish one of these odd looking craft and has

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FIRST DIESEL BARGES FOR THE ARMY



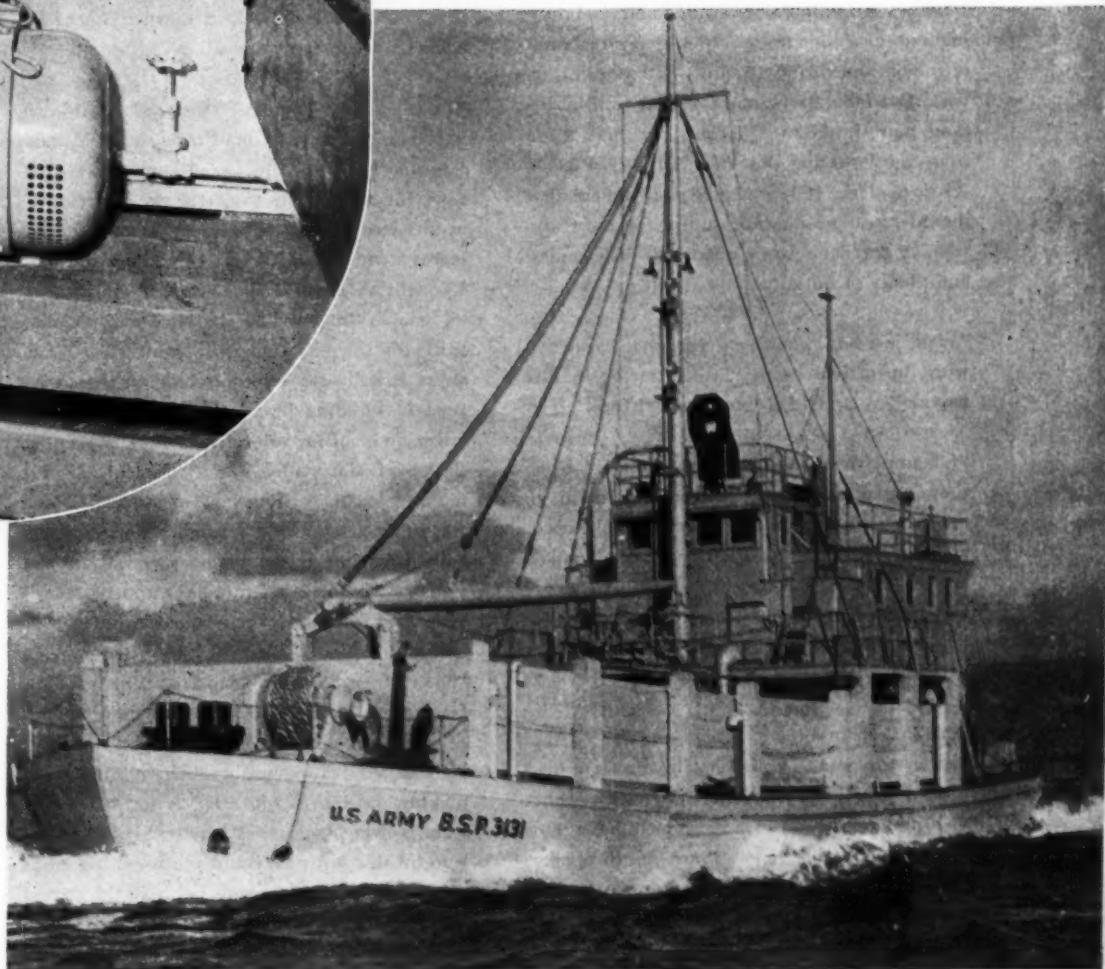
Auxiliary unit is a 1500 w. Kohler light plant.

shown.

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den barge
two more to go. Below, between the heavy
bulkheading, is tank capacity for 14,000 gallons
of cargo oil, while the entire forward deck is a
flat, barge-like area for easy cargo lighterage
work. A heavy boom and cargo winch is fitted
to expedite this, and plain fish-type railing,
solid, is fitted around the cargo deck area.
Comparatively roomy quarters for a crew of 9
are fitted.

Trial speed, loaded with nearly 200 tons of
ballast, showed 8.4 knots, yet these barges only
carry two 120 hp. six cylinder Buda-Lanova
Diesels, driving twin propellers. Twin hand
steer rudders are fitted and a Webster Brinkley
Solenoid type pilot house control for the main
Diesels is fitted, as well as a pair of automotive
type instrument panels, each side of the steering
wheel.

A 1500 watt Kohler light generating plant is
fitted, fully automatic, and power take off on
one of the Buda Diesels supplies a cargo pump
and deck machinery while the other Buda has



The Army's new power barges are broad-beamed, stable but highly mobile.
(Photos by Turner Richards, Tacoma)

a power takeoff for cargo pump and bilge pump.

An Allen oil fired heating boiler is fitted, and, believe it or not, but a \$3000 radio compass fresh off a transport! A 25 watt radio transmitter and Markey anchor winch and Markey towing winch; a Wade cargo winch; a company-made electric switchboard and an elaborate Sherman Lang alarm system plus a large York ice machine to keep the big built-in galley ice box cool, completes the equipment aboard this little ship. Not to omit mentioning a

beamie Shipmate oil fired galley range and porcelain sink.

Reports from Alaska indicate that out at Attu, Kiska and elsewhere on the stormy Aleutians this type is giving splendid account of itself.

Who says a funny looking, but highly practical ship type cannot be adopted for use by the busy Army, and a new ship-type of Diesel propulsion find a useful niche in a remote, but vital war area?

DIESELS HIT PAY DIRT

By F. HAL HIGGINS

"DIESEL tractors did more than cut in half the cost of moving a yard of dirt when they appeared on the scene in 1932 to start a revolution in that field." So declared Sam Cody, a farmer-dirt-moving custom man whose activities in Ladino seed farming and seed dealing had caused me to hunt him up on the banks of the Sacramento in Glenn county, California, twice last fall. Each time I visited Sam he became more interesting. I concluded here was a story worth setting down for DIESEL PROGRESS readers. It represented a new field that should have considerable future for men who want to get themselves a stake with little capital and plenty of initiative.

"Well, just how would you put what happened with the arrival of the Diesel tractor in dirt moving?" your Old Reporter asked Sam.

"I figure they permitted a double cut of costs; they permitted the LeTourneau Carryall to come in with the Diesel tractor and take a cut at both fuel and material; and they moved twice as big loads as had been permitted before and speeded up the load with easier and better loading, unloading and spreading of the dirt by power."

This statement of Mr. Cody's was interesting, as the writer had known that in the farm field the cut of half was seen in quotations by custom men in doing plowing, seeding, combining, etc., after they bought Diesels. Such instances were numerous from the Mexican border to Canada on the West Coast at the bottom of the depression when it meant so much.

But to get back to our hero, Sam Cody, and his new \$32,000 seed house full of alfalfa, Ladino and other soil building seeds, as well as a lot of almonds and the 720 acres he is farming after leveling the acreage himself with his fleet of five Diesel tractors, 3 scrapers and a land plane. A checkup of the Cody harvest on Dec. 1, last, showed 25,000 pounds of Ladino seed, and that kind of white clover seed was ceilinged at \$1.85 a pound for No. 1 seed last year, which adds up to \$46,250. Then he gathered 50 tons of almonds, and they were at an all-time top price. Alfalfa piled up 200 tons, Canadian peas 1,100 bags, and pink beans another 1,000 bags. All

these are up against wartime ceilings, of course.

Leave the crop Sam took off and had housed in his new \$32,000 seed house for a moment and get back to his humble start on a shoestring that enabled him to make a down payment on a Diesel tractor and carryall.

"I had got my shoestring that made this down payment by buying a small truck in 1935 when I started hauling grain," said Sam. "I did that work for seven years to get to my opportunity at dirt moving. Then one very wet winter the levees went out. That was the winter of 1937. I bought a Caterpillar RD7 and an 8-yard carryall scraper from the local dealer and went to work for the big Marysville contractor, Hemstreet & Bell as a sub-contractor on their contract of building levees along the Sacramento river. Some of my sub-contract work was under Parker of Marysville. But it was a big job for me and I was learning how to use that Diesel tractor to get the best results as I went along. Also, when the levees were finished and I got other work on fair grounds, airports, etc., I keep studying the work and the machines.

"Soon I got to taking land leveling jobs for farmers and noticing what they were doing with this land they leveled. The white clover from Italy called Ladino was coming in and it was making good in a big way. A lot of farmers were growing Ladino, as it responded to irrigation on this soil nicely and produced big crops of seed—100 to 300 pounds per acre the second year. Leveling work usually ran about \$40 to \$50 an acre, so it was quite an investment for a farmer to have a piece leveled. When I had observed what was going on in soil building seeds like Ladino, alfalfa, etc., I began making deals where the farmer couldn't quite figure he had the money to have the leveling done that season. I would offer to do the job for the use of the land for two seasons. The first year Ladino doesn't yield much, but the second year it is likely to be a 300-pounds-per-acre yielder.

"By 1939 I was able to buy myself a piece of land. Only 120 acres in this first purchase and I put 40 acres into Ladino immediately with a second 40 into alfalfa. It's important to start



with the fields clean and keep them that way for these crops, of course. Leveling helps bury old seeds if any are there, of course, but it calls for plenty of vigilance to keep a field clean by cultivation, pasturing, etc. Well, both these seed crops paid off well. One crop paid for my 120 acres. I am now farming 730 acres: 120 acres in almonds, 300 in Ladino, and the rest in alfalfa, beans, peas, and so on. I was offered \$15,000 for one farm with the house on it. Living quarters are scarce these times, so anything with a livable house on it is at a premium on farms up this way."

We went out and drove around the Cody farms while he knocked off a bag of pheasants, this being opening day of the season. We came to two of his Diesels at work leveling more land for more Ladino and alfalfa and stopped to take pictures. Sam's two children were along, this being a day when they had no school. Everybody was enjoying the life out on the farm with the finest game hunting right on the land Sam had leveled with his Diesels to build himself a neat little fortune via the Diesels in and on dirt.

Maybe there is some nicer way of cutting yourself a stake in this old world's better life than Sam has found, but after pondering the thing for some weeks since leaving Sam at his seed house, I can't think of any. To start with he

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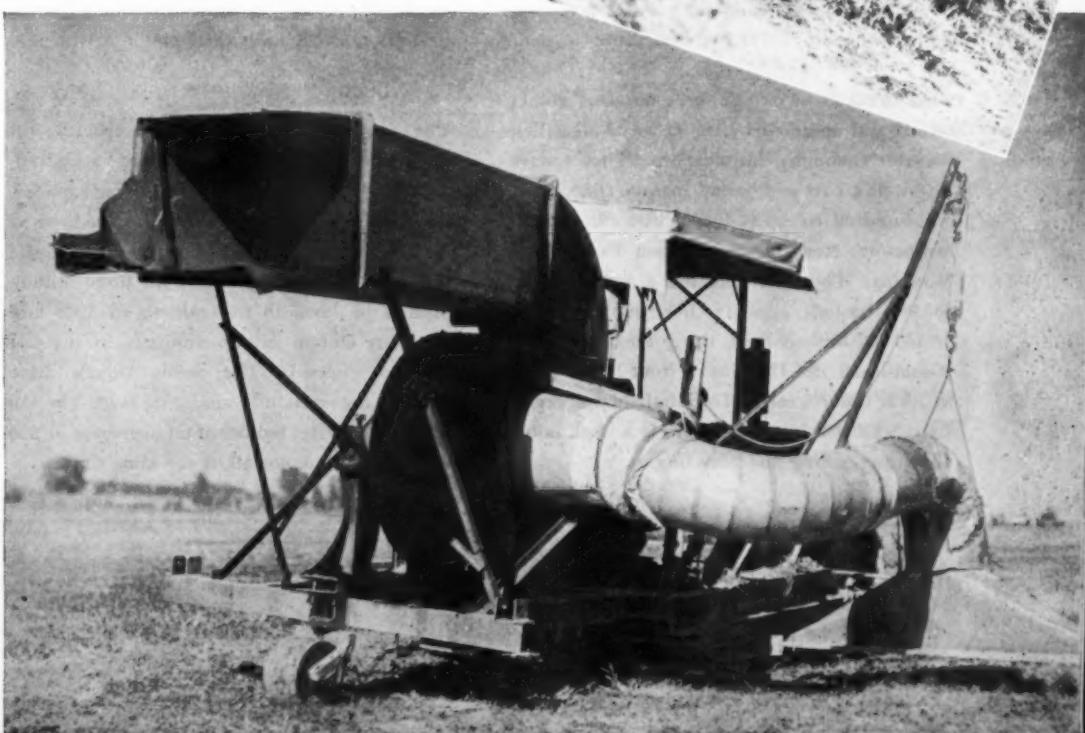
Left: Cody's Caterpillar Diesel tractor and carry-all earn extra money on land leveling jobs. Below: A Ladino seed harvest scene. Bottom: This vacuum cleaner mounted on a Diesel tractor salvages loose Ladino seed from the ground after harvest.



Sam Cody and "help" take time out to pose for the author.

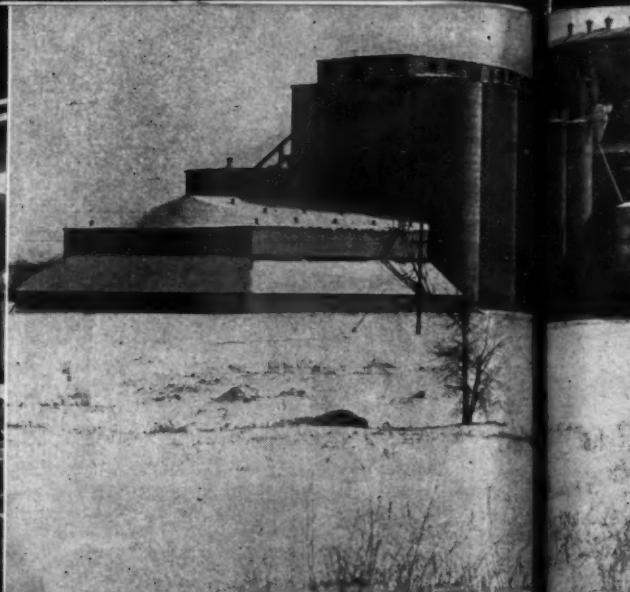
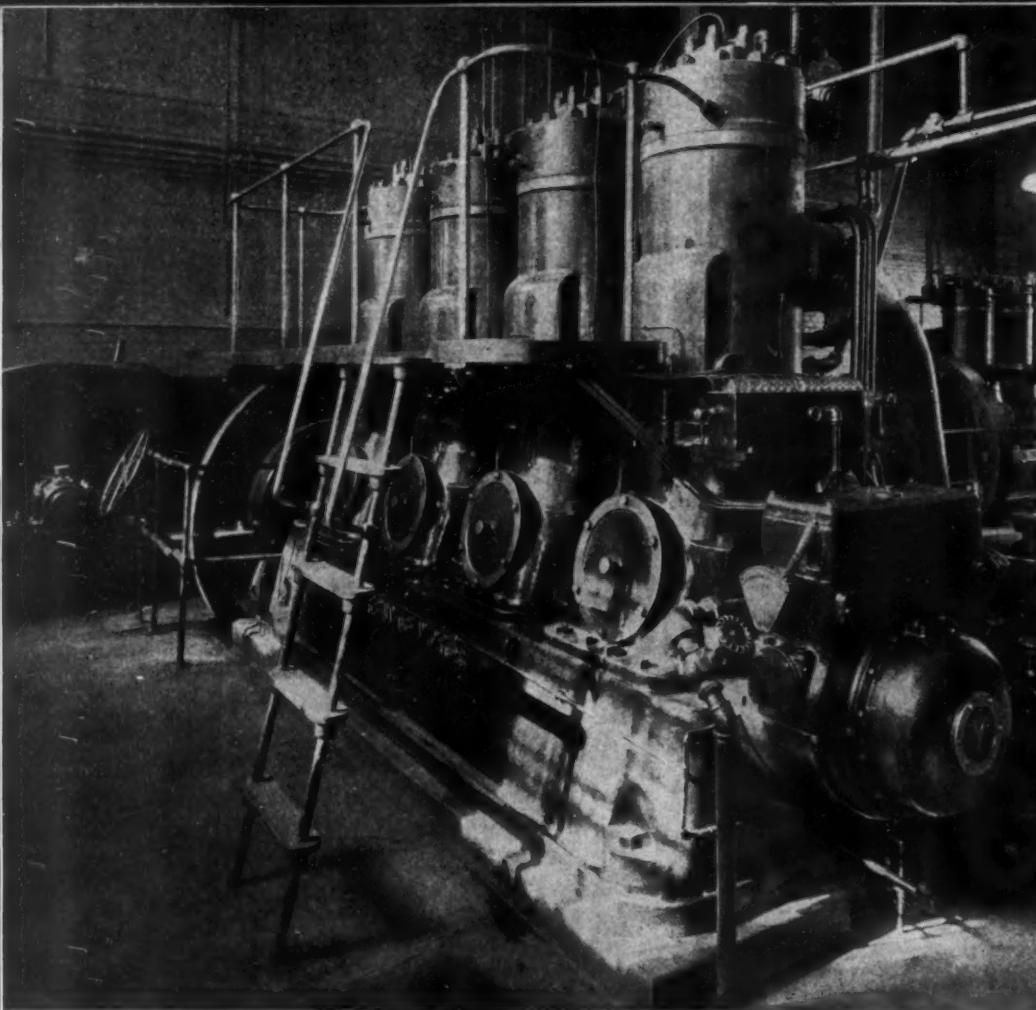
has these things in favor of his project:

1. No land erosion.
2. He works for himself while land leveling and adding \$50 an acre to the value of his land.
3. He grows a crop that seems to have no limit of demand at any early date as soil building crop demands increase rather than diminish under Government teaching.
4. His family is out in the country and growing up to appreciate the outdoors.
5. He is earning more money and banking it in his own land than he could at any other game.
6. He is teaching his younger generation the know-how of big Diesel tools and their value in building themselves a future.



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Exterior view of the 325 bushel Shoreham Elevator, Minneapolis, Minnesota.

One of two Diesels in the Shoreham elevator is this Fairbanks-Morse, 4 cylinder, 240 hp. unit installed in 1926.

The other 3-cylinder, installed in 1928.

VETERAN DIESEL

By T. J. MALONE

TWO Diesel engines in the Shoreham grain Elevator in Minneapolis, veterans of sixteen and eighteen years' service, are about to be rehabilitated by installing, throughout, rebored cylinders, new oversized pistons, new piston rings and new piston pin bearings. This procedure is expected to extend for like periods the usefulness of the engines in furnishing the power that moves yearly ten to twelve million bushels of grain through the elevator.

The Shoreham is one of three terminal houses owned and operated by the Osborne-McMillan Elevator Company, Minneapolis. They receive wheat, flax, oats and barley, mainly, from about one hundred company-owned line elevators in Minnesota, North Dakota, South Dakota and Montana. The Shoreham has a warehouse of 350,000 bushels capacity, five concrete tanks of 150,000 bushels each, thirty tanks of 33,000 bushels each and 115 bins of from 18,000 down to 1,500 bushels each. The total storage capacity is 3,250,000 bushels. There is a work house also, for cleaning and blending.

Both Diesels powering this elevator are of Fairbanks, Morse & Co. make. One, installed in 1926, is a 240 hp., 4-cylinder, mechanical-drive unit with silent chain. The other, installed in 1928, is a 180 hp., 3-cylinder, generating unit with alternator and auxiliary equipment. The former carries the main load, operating elevator legs, cleaners, car pullers; the latter operates all the conveyors, and some cleaners through individual motor drives, also the lighting system.

The total of 420 horsepower capacity was planned to meet the power needs of an expanding elevator. In pace with new storage capacity, constructed at intervals, turnover, expedited by loading-in and loading-out tracks at opposite sides of the building, rose from three million bushels in 1926, to five million in 1928 and to about eleven million annually in the last four-year period. The same Diesels have handled the constantly mounting load. The 180 hp. unit operates motors of an aggregate of 330 horsepower—but not all at the same time.

In use eight to ten hours a day, six days a week, virtually the year round, these engines have earned high tallies on the books for sound performance, fuel economy, and low maintenance and operating costs. They paid for themselves in the first eight years in savings against the cost of purchased energy. Plant authorities say they have given little trouble in operation; their course has been uneventful, their graph a straight one.

The Diesel plant operates on a fiscal-year basis May 1 to April 30 inclusive. The 180 hp. unit went into service, along with the 240 hp., on September 24, 1928. It is noteworthy that the two Diesels operated in the latest fiscal year completed at this writing, 1943-44, on virtually the same volumes of lubricating and fuel oils as in 1928-29 while turning over more than twice the volume of grain and carrying a 30 per cent higher average horsepower load. Note also that the average power load increased only 30% despite the large increase in turnover. Here is a table of comparisons:

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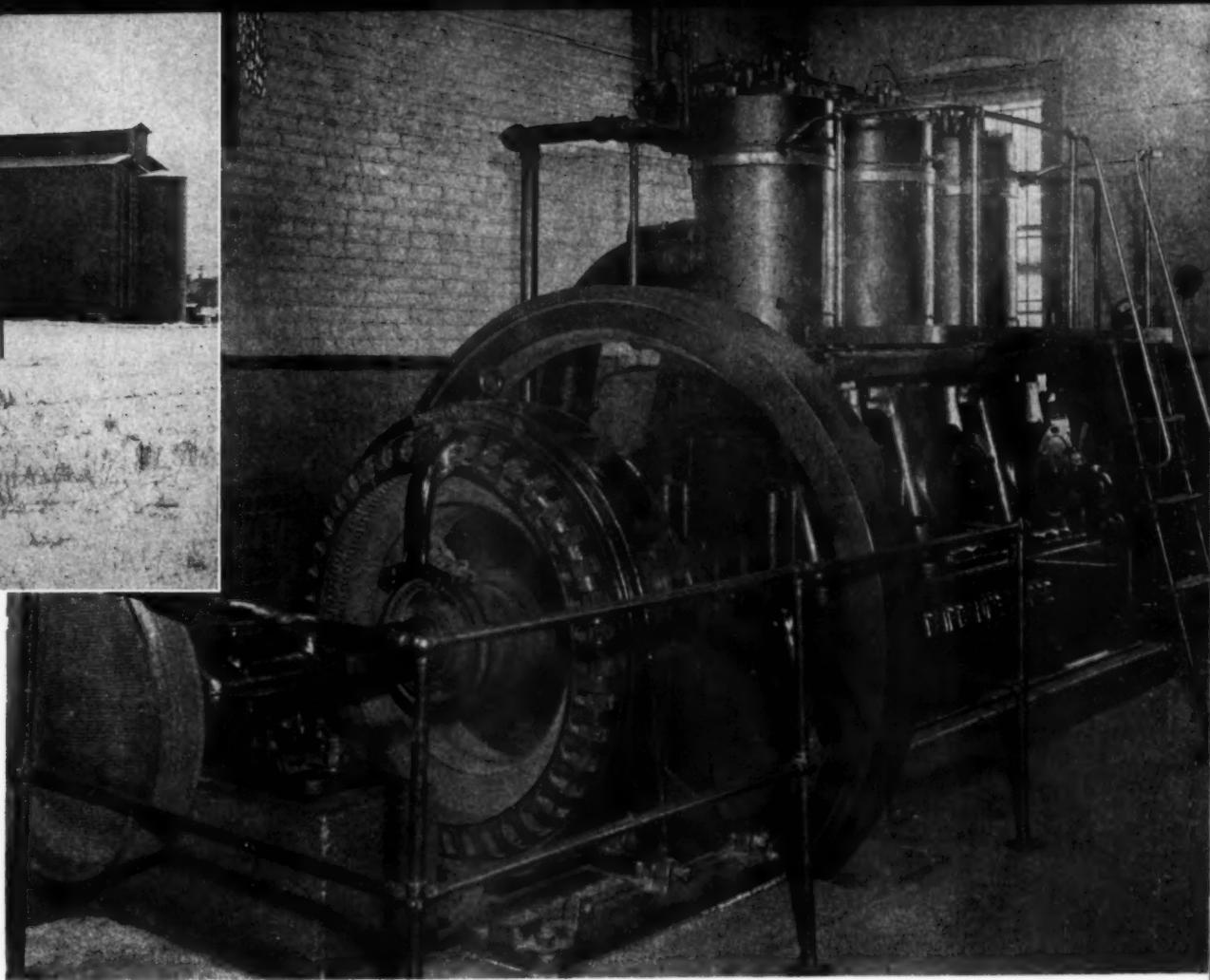
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The other engine is this F-M,
cylinder, 180 hp. Diesel, in-
stalled in 1928.



DIESEL MADE "LIKE NEW"

Fiscal Year	1928-29	1943-44
Lub. Oil, Gals.	606	629
Fuel Oil, Gals	33,423	33,127
Cost, Both Oils	\$2,167	\$2,404
Turn-over, Bus.	5,000,000	11,000,000
Avg. Hp. Load	200	260

(1928-29: Lubricating oil, 55 cents a gallon; fuel oil, 5.5 cents; 1943-44: 60 cents and 6.12 cents, respectively.)

Greatly increased turnover at about the same oil consumption for a 12-month period is held to indicate three significant things: sustained efficiency of the engines, more efficient load condition of the plant and more efficient operation of the elevator.

Making an overall checkup of the Diesels recently, Fairbanks-Morse service engineers put them through the clinic. They tore the engines down and gave them a thorough going over. Such an inspection hadn't been made since they were installed. The findings led to a de-

cision to replace the cylinders with rebored ones turned out in the manufacturer's plant. Re-bored cylinders were recommended as giving service "like new" and at considerable cost saving.

The replacement items will be set up and broken in at the factory, and delivered at the Shoreham ready to go to work as soon as installed. The cylinders replaced will be taken over by the manufacturer and credited. This is in line with the F-M service policy.

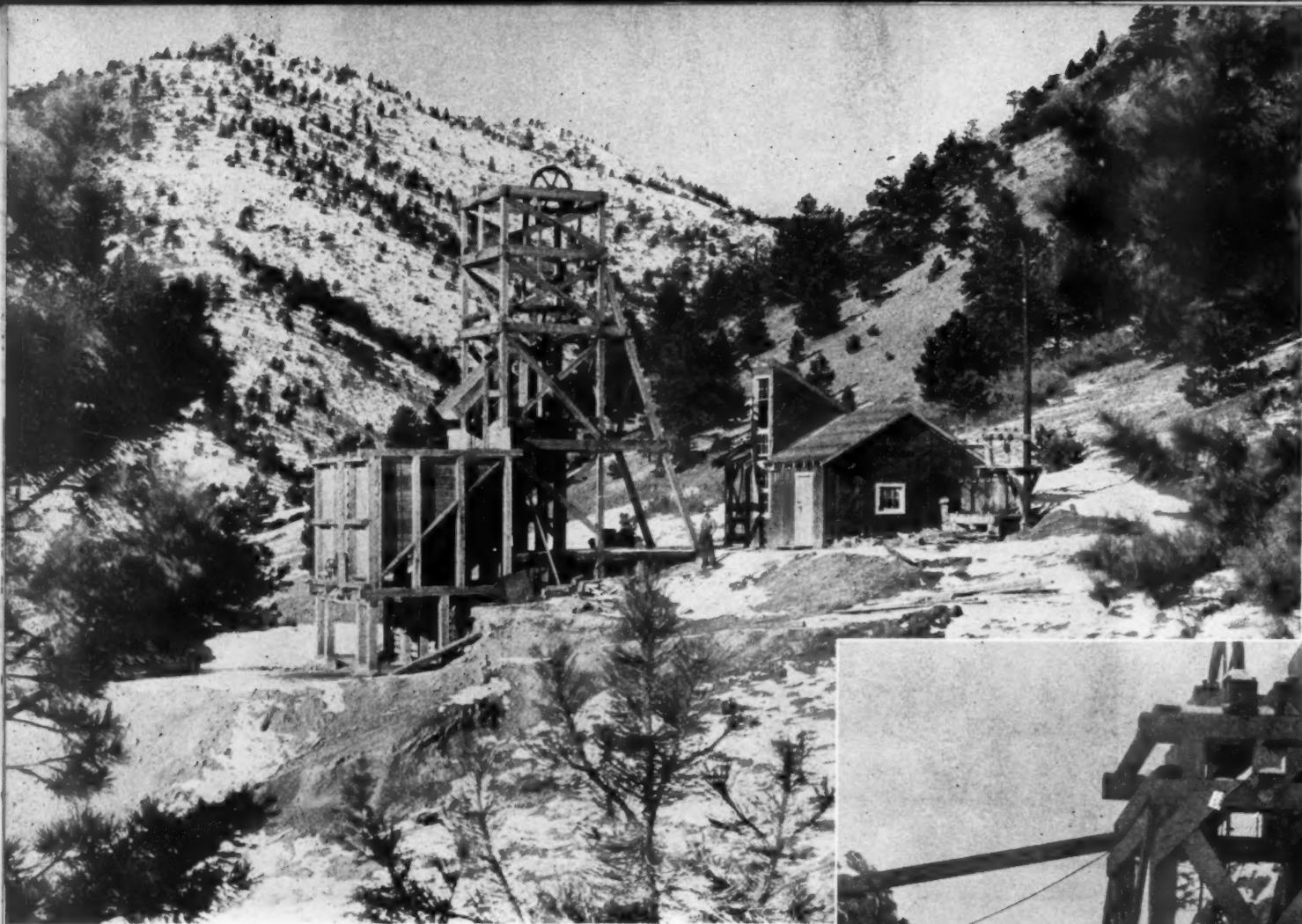
An impressive phase of this record of Diesel experience is the operation of the chain in the mechanical-drive unit. A Morse chain, 19 ft. 5 in. long, has been running without relief for eighteen years. A spare, held in reserve, has never been taken from its box. Routine yearly inspections of the chain have disclosed only an occasional broken link or missing pin, easy to replace.

But what that chain has gone through! By the

rated rpm. of the driving sprocket on the engine, the chain travels about 1,221 feet a minute, 13.87 miles an hour, 34,632 miles a year. In eighteen years it has traveled 623,376 miles, or about 25 times the distance around the earth.

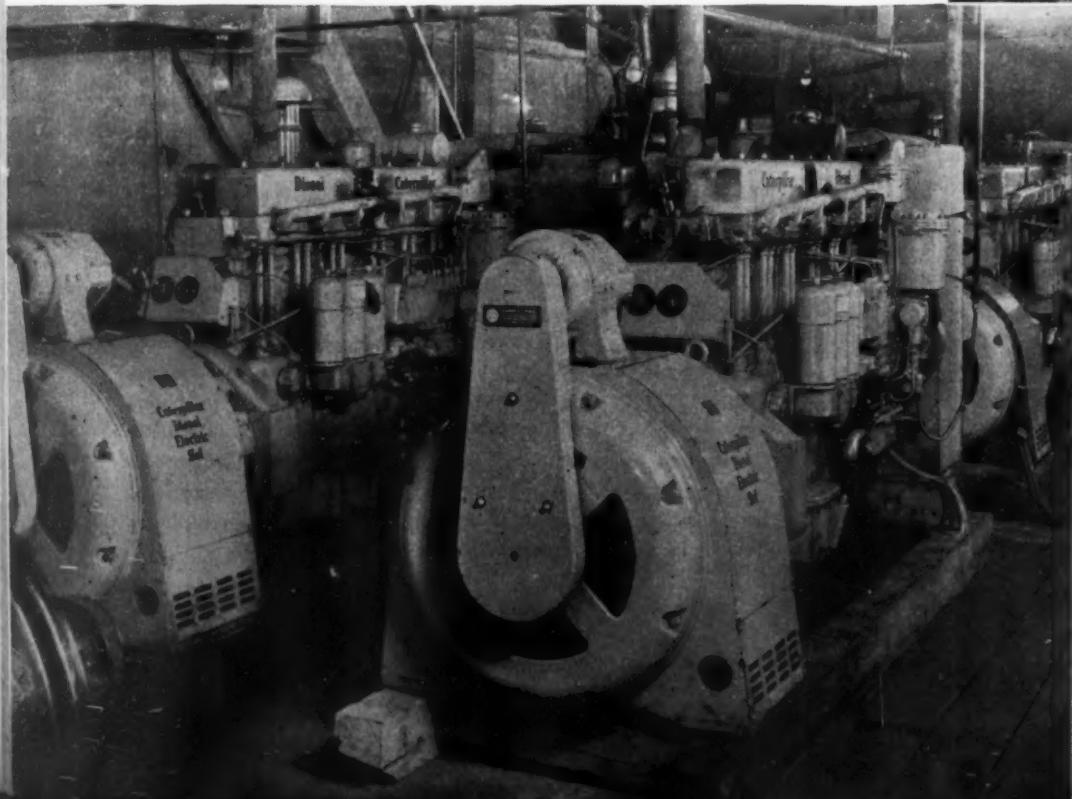
In the fable of the exchange between the dial and the pendulum, the pendulum complained of its hard lot: forced to swing back and forth so often every minute, every hour, every day, every year, and so on with no end in sight. The chain at the Shoreham, besides doing all that traveling, has moved its part of a grain turnover estimated at 156 million bushels for the eighteen years—and not a word has been heard from it. It is a silent chain.

In addition to Fairbanks-Morse Diesels and Alternator, the elevator has a 1,000 gpm. motor-driven F-M underwriters' fire pump and a 1,300 gph. F-M "Typhoon" plunger pump. All motors in the elevator, with one or two exceptions, are of F-M manufacture, and it is completely equipped with F-M scales.



The Fluorspar mines and mill of Harry M. Williamson & Son at 7200 ft. elevation near Jamestown, Colorado, turns out 100 tons a day with three Caterpillar Diesels furnishing all the power for mine and mill.

DIESELS AT 7200 FOOT ALTITUDE POWER FLUORSPAR MINE



Shaft head of the Williamson Fluorspar mine where ore is brought to the surface.

Main and only source of power for this high-altitude mine, are the three Caterpillar Diesel-generating units, seen in this view.



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The Whitcomb Diesel-electrics snapped right after delivery to the Vermont Marble Company.

DIESELS IN THE "ROCK RIBBED" HILLS

By WILBUR W. YOUNG

TAKing a short dip into history it is recorded that New Englanders of the early 19th century had small interest in the idea of rail transportation being marine- and water-minded. But it is also recorded that the first "Tramway" of more than one hundred small roads which later comprised the New York, New Haven and Hartford System, was chartered to haul stone from the Quincy quarries to build the Bunker Hill Monument. So we have one of the earliest and one of the latest developments in rail transportation identified with haulage of stone.

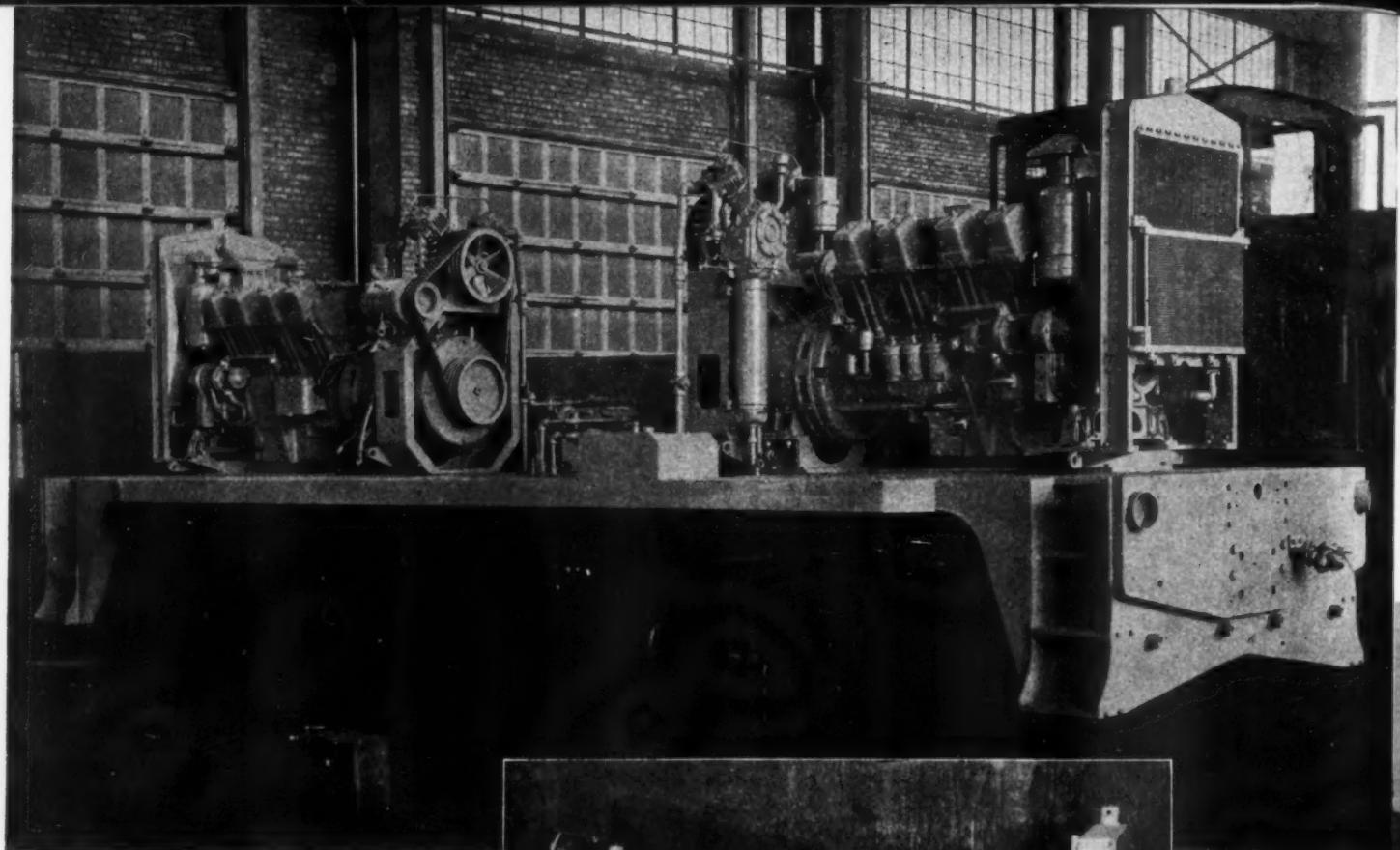
For today the hills of Central Vermont, where the quarries of the Vermont Marble Company abound, are echoing the purr of two new Whitcomb Diesel-electric locomotives in place of three outmoded steamers which for many years have chugged along the 18 miles of the Claren-

don and Pittsford Railroad. Owned and managed by the Vermont Marble Company through mutual ownership of outstanding stock, the same individuals being officials in both companies, this railroad which connects its quarries and various processing and finishing plants, is sixty years old. It was built and acquired in short sections, the first 2 miles from Proctor north having been laid in 1884; then 8 miles from Proctor to West Rutland in 1885; from Center Rutland to Rutland, 2 miles, in 1901; in 1902 the road was extended to the Hollister Quarry and in 1911 the company purchased the Brandon and West Rutland Railroad at Florence, also in the same year it acquired the Pittsford and Rutland where it connected with lines that form the present Rutland Railroad. In addition to its 18 miles of main line, the C & P has 4.29 miles of branch lines and 1.76

miles of switching and yard lines. It also operates over 1.59 miles of the Rutland at West Rutland.

This rather elaborate system of trackage is understandable when you realize that its owner and operator is the largest Marble Company in the world having furnished the stone for many of the Nation's finest buildings including the Supreme Court building, Washington, D. C.; The Arlington Memorial Amphitheatre and Tomb of the Unknown Soldier, Arlington, Virginia, The Thomas Jefferson Memorial, Washington, D. C.; State Capitol, Salem, Oregon and many more.

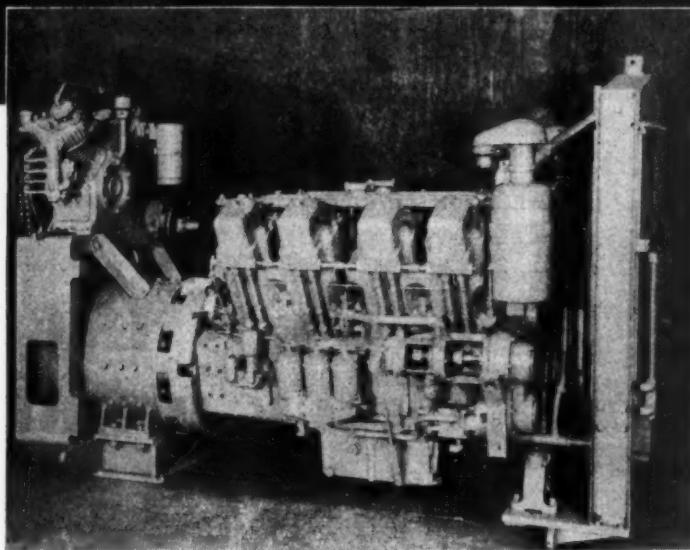
And while we are talking about this interesting company let's take a look at its war record. We who are not fully informed might not



Shop view of the Whitcomb locomotive chassis with the complete power unit assemblies in place; these are Caterpillar Diesels and Westinghouse generators.

associate marble with the war effort but tons of marble are being processed up in Proctor, Vermont for Veterans Hospitals and Government-allotted headstones and memorials all over the land. But that is not all: one huge plant, the one originally built to finish the marble for the Supreme Court Building, has been converted for heavy machining operations in the manufacture of large uniflow marine steam engines, ship winches and various heavy equipment, all essential war products. Another department, employing some 50 women, is turning out radio condensers and intricate radar circuits and still another department is producing thousands of M-14 cartridge storage cases for 155 MM shells. What more could a marble company do to help our war effort? And what is more the Army-Navy "E" pennant proudly flies over this vast operation.

If we examine a few physical features of the Clarendon and Pittsford Railroad the big job which the two new Whitcomb Diesel-electrics have undertaken becomes apparent. The profile shows a total grade length of 14,400 feet with a total rise of 260 feet, an average grade of 1.81 per cent with an average curvature approximating 3 degrees. There are a few short sections of 4 per cent grade. Maximum trailing load (specified) is 450 tons.



Close-up of the Caterpillar Diesel showing air compressor drive arrangement.

The Thomas Jefferson Memorial, Washington, D. C., built of Vermont Marble by the Vermont Marble Company.



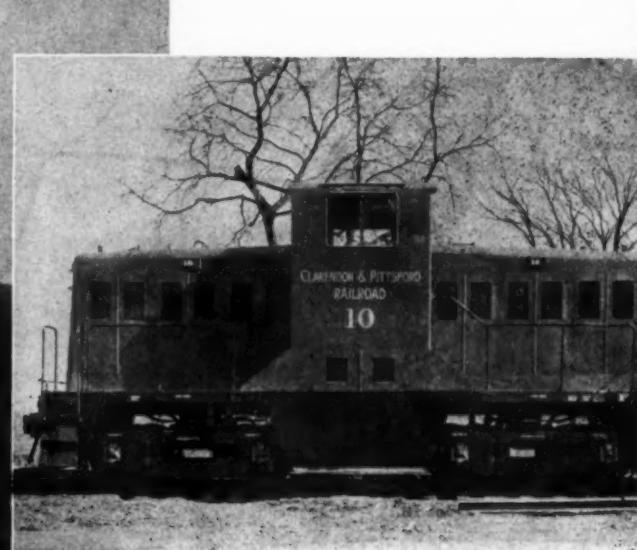
for these conditions the units selected are 50 ton switching type Diesel-electric locomotives rated 380 hp. each. Maximum tractive effort (with stand) is 33,300 lbs. Built by The Whitcomb Locomotive Company, subsidiary of Baldwin Locomotive Works, these units are each powered with two Caterpillar 8 cylinder, V-type Diesels driving Westinghouse railway-type generators which supply current to the four truck-mounted Westinghouse traction motors. The midships, full vision, cab is fitted with single action, electro-magnetic straight parallel, with

electro-pneumatic throttle control. The Diesels are rated 190 hp. each at 1000 rpm. and are equipped for battery starting by motoring the generator. A Westinghouse auxiliary generator is driven off each main generator extension shaft charging the batteries in parallel. These locomotives are sturdy, well coordinated motive power units whose responsiveness is already winning approval of operators who have pulled steam throttles for many years.

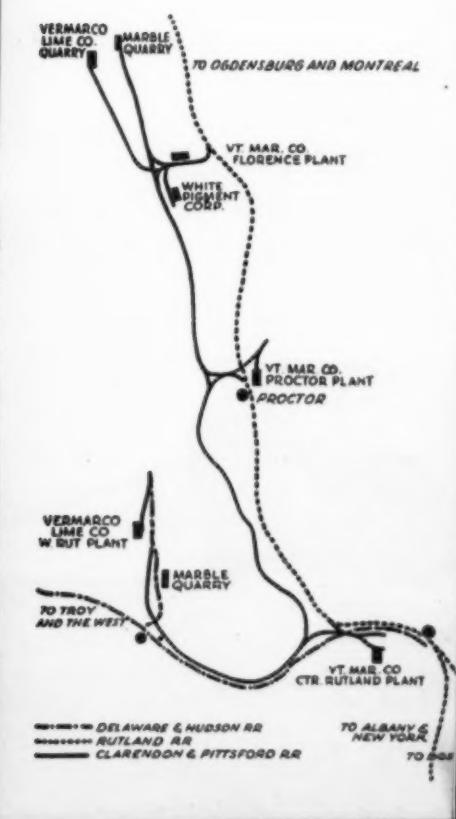
About $\frac{1}{4}$ of the operating time is on the main

line and $\frac{3}{4}$ on switching which renders this an ideal operation for the full realization of Diesel economy and availability.

Supervising the operation of this thrifty and privately owned railroad are W. M. Fay, president; C. C. Thomas, vice president and superintendent; H. V. Smith, treasurer; S. L. Burns, secretary; E. W. Olson, general freight agent and H. C. Pratt, purchasing agent, all of whom are also officials of the Vermont Marble Company.



Above: Two of these Diesel-electric units replaced three outmoded steam locomotives. Left: A typical marble quarry in the hills of Vermont. Below: Map of the Clarendon and Pittsford R. R.

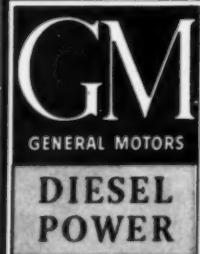


The World is her Oyster

She's traveled sub-infested seas, rescued torpedoed crews, delivered barges to the Aleutians, dredges to Greenland and the Panama Canal. She's hauled some of the toughest tows—100 times her own weight—through the meanest weather of both oceans.

Her power plant?

GENERAL MOTORS DIESEL-ELECTRIC DRIVE



ENGINES . 150 to 2000 H.P. CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

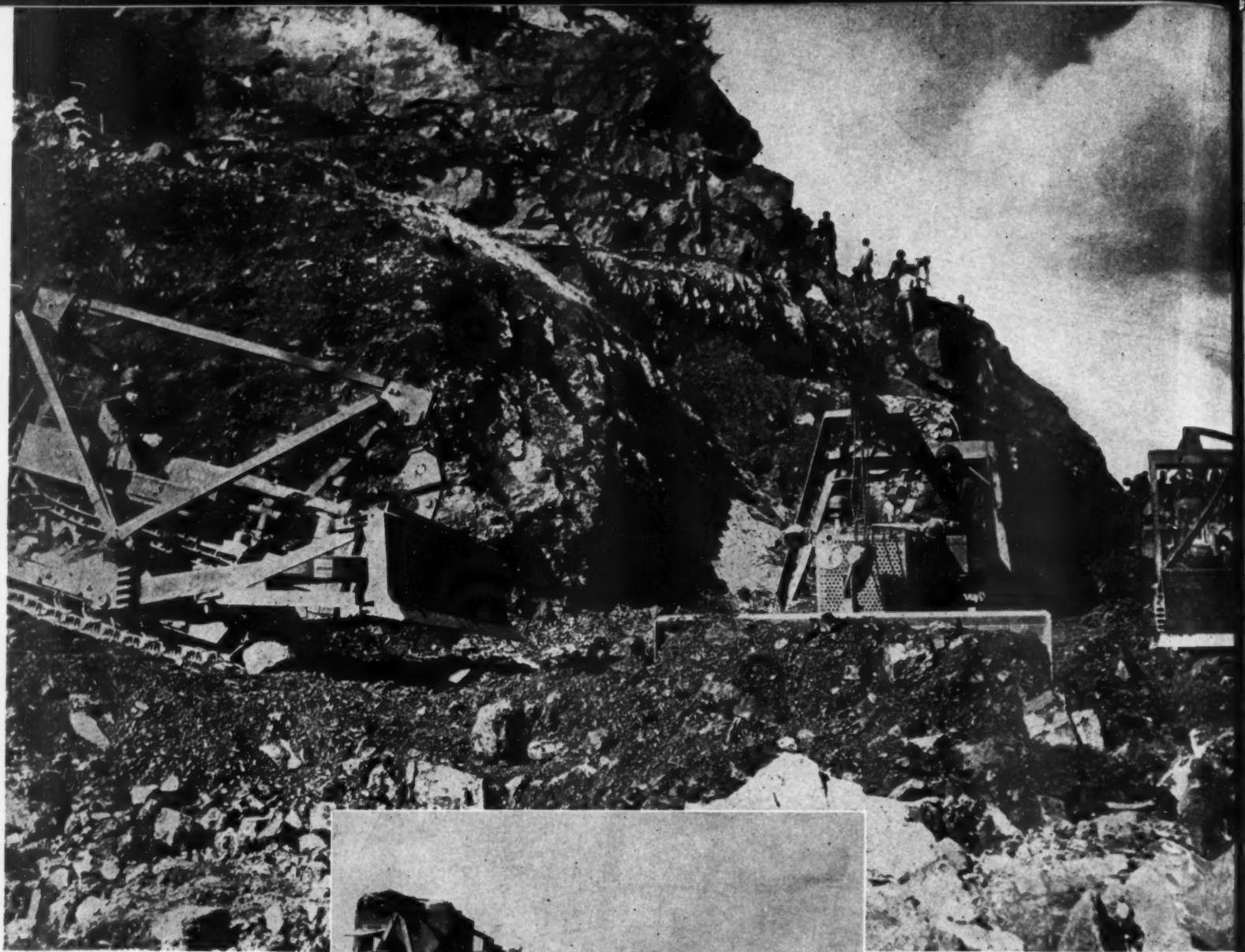
ENGINES . . . 15 to 250 H.P. DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.

LOCOMOTIVES ELECTRO-MOTIVE DIVISION, La Grange, Ill.

The EDMOND J. MORAN, 121 feet of
tough towboat powered with two 950
horsepower General Motors Diesels.

KEEP AMERICA STRONG
BUY MORE WAR BONDS





Caterpillar Diesel tractors with angledozers clear debris to open a tunnel on the Cherbourg line that was blasted by retreating Germans.

Clearing destroyed German vehicles from road leading to Montelimar. The Caterpillar Diesel tractor shown, is fitted with armored cab.



DIESELS CLEAR WAR WRECKAGE

In the Mignano sector, Italy, a Caterpillar Diesel with angledozer clears a road of deep mud. All views on this page are Signal Corps photos.



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MAY 1945

NEW HYDRAULIC UNIT FOR SINGLE SCREW, DUAL ENGINE MARINE PROPELLION

By A. E. (DUKE) YOUNG *

DEVELOPMENT of a new hydraulic unit contributing to the trend toward multiple engine installations in the marine field has been announced by the Twin Disc Clutch Company. Designed to permit two engines to turn a single screw, this new assembly—known as the multiple engine hydraulic drive—is readily adaptable to installations of all makes of Diesel and gasoline propulsion units utilizing a pair of engines developing 150 hp. each in the speed range of 1200 to 1800 rpm. For twin screw propulsion, two pairs of engines of this capacity, each driving through the unit, can be used. This arrangement provides a maximum power output of 600 hp.

The Twin Disc unit provides not only the already established advantage afforded by this type of drive, such as reduced space and weight requirements and lower initial cost, but it also incorporates the many desirable operating characteristics inherent in hydraulic drives, which may be summarized as follows: (1) The power is more flexible because each engine operates independently of the other. (2) The power is smoother because cyclic variations and vibrations are damped out. (3) Hydraulic drives simplify the problem of synchronizing two engines, always a major difficulty in mechanically operated multiple engine drives.

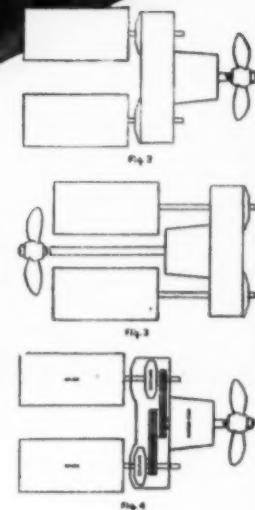
The Twin Disc multiple engine drive is a simply designed, compact assembly. It consists of a hydraulically actuated Twin Disc marine gear which is attached to a chain case assembled on the flywheel end of the engines. Within the fabricated, welded steel housing of the case are two hydraulic couplings which tie the engines together and transmit the power to the marine gear by means of a chain drive.

*Assistant Sales Manager, Marine Division,
Twin Disc Clutch Company.



Above: The author and his combination hydraulic and marine gear unit for single screw, dual engine propulsion.

Schematic arrangement of two methods of applying the combination drive unit to dual engine drive to a single propeller shaft.



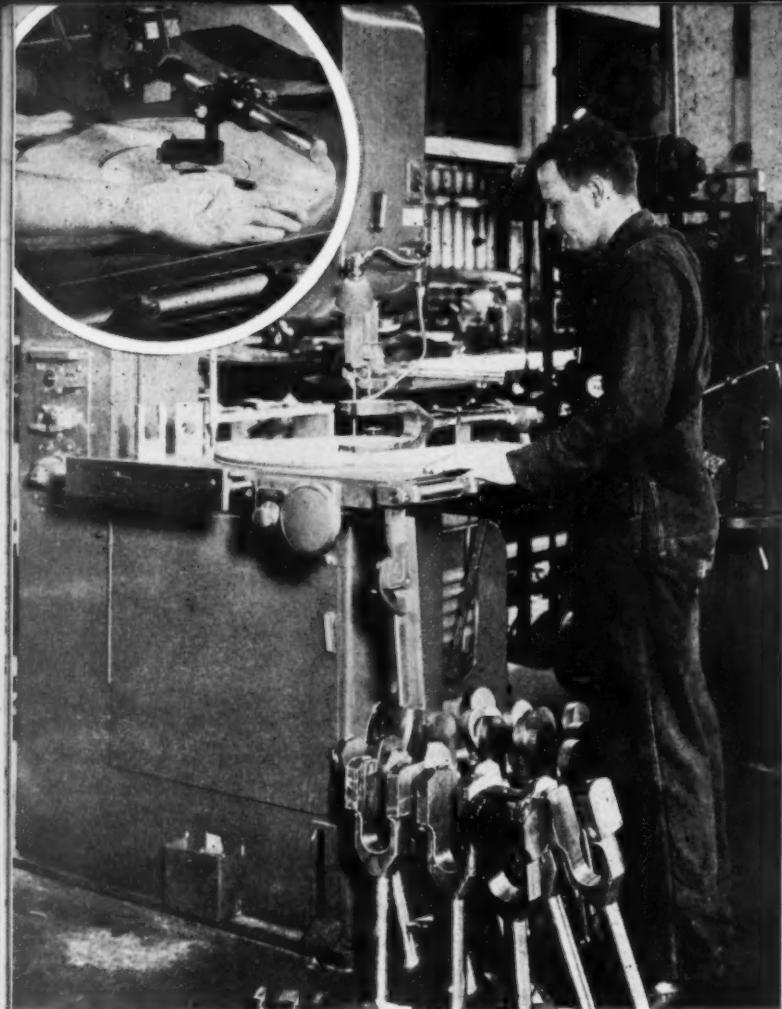
This multiple engine drive is so designed that it offers the boat owner the choice of two installation plans, either of which is also applicable in cases where four engines are employed, each pair driving a single shaft to provide twin screw propulsion. One arrangement calls for the mounting of the chain case and marine gear aft of the engines, as shown in Figures 2 and 4. Or, if preferred, the chain case may be mounted forward, with the drives from the engines attached to the opposite side of the chain case and the propeller shaft extending aft between the engines, as illustrated in Figure 3. In either case, each pair of engines have the same rotation, counter-clockwise looking at engine flywheel for a standard right-hand propeller when the assembly is installed as shown in Figure 2; and clockwise looking at engine flywheel for a standard right-hand propeller when the assembly is installed as illustrated in Figure 3. The overall length of the installation is approximately the same with either arrangement and, in either case, sufficient space is provided between the engines to permit maintenance or repairs without pulling one of the engines from the base.

By the introduction of the hydraulic couplings into the drive, each engine is permitted to operate independently of the other within the slip range of the couplings. This fact greatly simplifies the problem of synchronizing the engines and eliminates the difficulty encountered in attempting to balance engine loads by mechanical means.

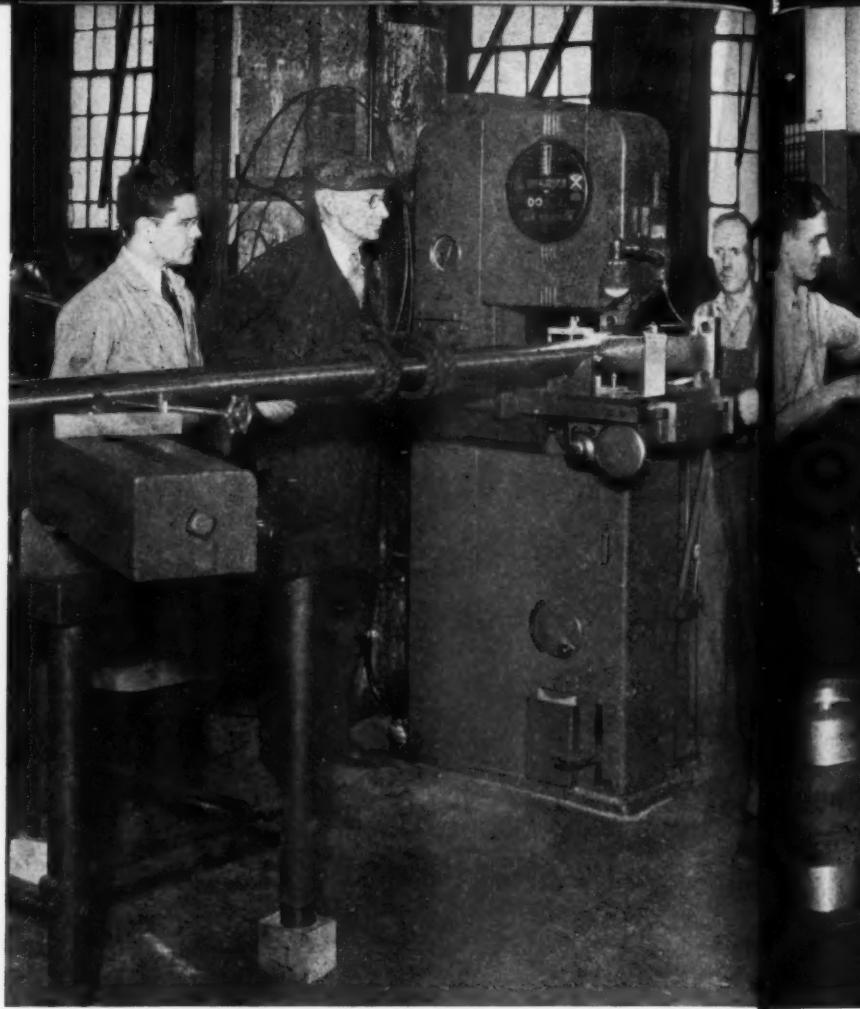
Comparing the single screw, dual engine assem-

bly with the single propulsion unit of equal horsepower output, it readily can be seen that the former offers the boat owner important savings in weight, space and original installation cost. The extent of these savings is indicated by the comparison of a representative group of well known engines in the horsepower and speed range (150 hp. at 1200-1800 rpm.) suitable for the multiple engine drive with a second group of popular makes of slower speed engines of a size required to produce the equivalent 300 hp.

The multiple engine drive as described here represents the culmination of several years of intensive research and development work. A forerunner of the present unit was installed in the Gray Marine Diesel-powered vessel *Caritas* in 1942. After three years of service, this installation is still giving complete satisfaction in every way with no major repairs required to date. One of the more recent installations of Twin Disc multiple engine drives was made on the *Sea Nymph*, 100 ft. x 20 ft. x 10 ft. 6 in., this time in connection with a pair of Model . . . And now please turn to page 78 . . .



Contour sawing Diesel engine connecting rods, using specially designed circular fixture to form radius.



Contour machining large Diesel rod bearing using special sub-table and fixture to handle straight cut and radius with same setting.

*Contour...
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product...*

CONTOUR SAWING MACHINERY

By H. J. CHAMBERLAND

MANY valuable discoveries have resulted from research and engineering to help us fight this war and speed it to a victorious end. Among them the contour sawing or machining process will rank high in the realization of this achievement and in the fabrication of better things to come.

On the tenth anniversary of its introduction to industry, regardless of the fact that so many methods of the past in their present form of development render initial design obsolete, the contour sawing process still remains revolutionary because no substitute has been found to even be classed as an equal from the point of view of general economy.

While this type of equipment has already been proved indispensable in cutting all types of basic materials ranging from stacked newspapers to alloy steel, we shall treat the subject chiefly from a metal-working angle, using the modernized term "contour machining" and what the process has already and might in the future contribute to the Diesel engine field.

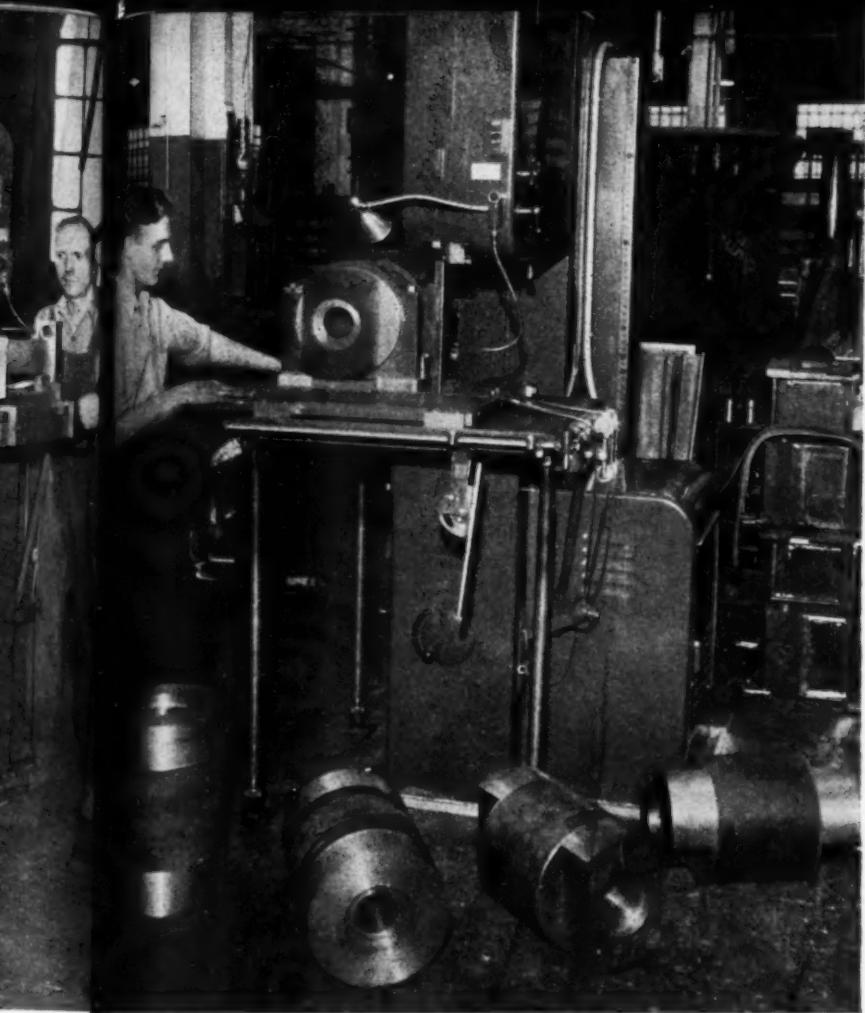
It should be made clear however that typical applications to be described are but a few of many contour machining operations to expedite Diesel engine parts, or tools and accessories related to Diesel production as a whole. In this respect, some manufacturers are very considerate in sharing secrets of economy or so-called

"tricks" in cutting costs of production. So to visualize unseen performance, it is proper to present the contour machining process not only as means of saving time and material but also as an aid to conventional type machine tools.

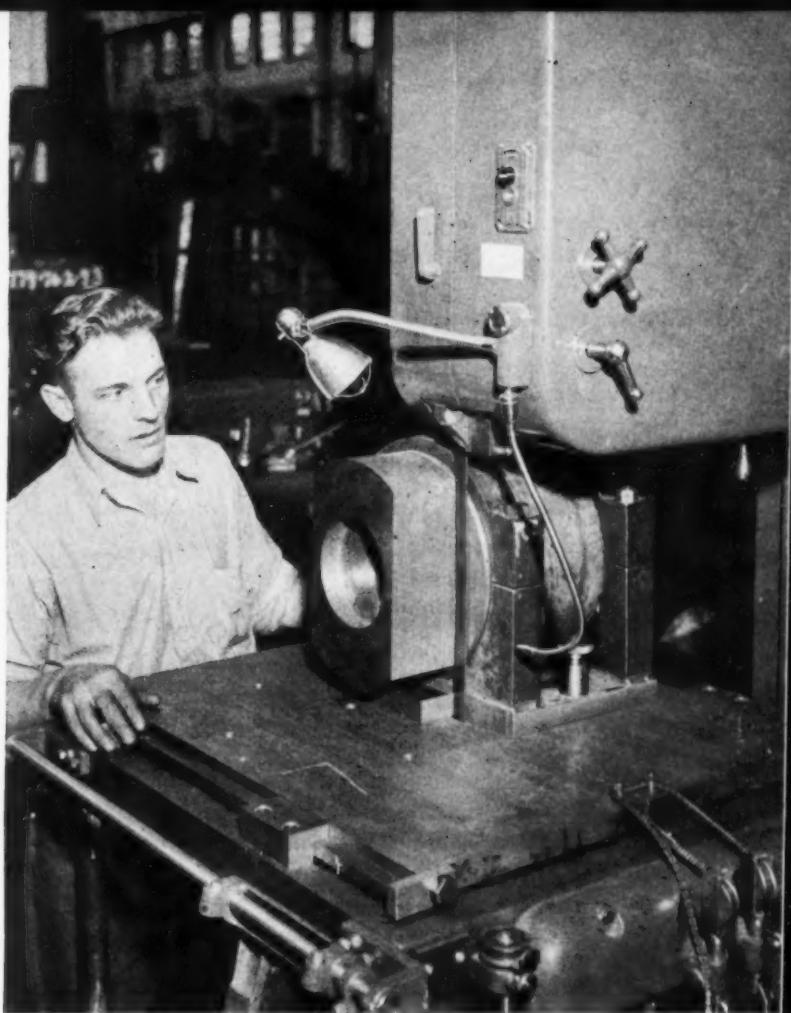
The production of Diesel engine connecting rods, for example, is a short run problem and will remain so for some time. Incidentally the term "short run" can mean any quantity from 6 to 1000 parts and even more insofar as a contour machine is concerned. All types of connecting rods are made of very tough steel and are generally forgings. In the case of mass production, such as with automobiles, the cost of forging dies is immaterial because its effect on increasing the per-piece cost is negligible. With short run production it is not uncommon for tool cost to actually double cost of production per piece.

With the rods by die cost be serviced one used a milling

With the saving is by simply lathe mu complete ups. It is connecting conventional piece. A permits and other



Contour machining 350-lb. Diesel wrist pins on regular production schedule, releases conventional machine tools for vital production.



Close-up of the operation shown next left, illustrating means for locating all sawing positions.

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With the processing of Diesel engine connecting rods by conventional means, excessive forging die cost cannot be avoided and these dies must be serviced and eventually wear out. Some manufacturers eliminate some dies such as the one used for wrist pin cut-out, assuming that a milling operation is cheaper.

With the aid of contour machining the primary saving is the elimination of costly forging dies by simply forging a solid piece. In this case the lathe must necessarily remain a part of the new technique; however, the parts are otherwise completed by various contour machining set-ups. It is now possible to complete one of these connecting rods in about 45 minutes whereas conventional procedure consumed 8 hours per piece. As noted, the use of a circular fixture permits cutting all contours uniformly; these and other accessories are individually devised

to suit the nature of the cutting operation.

In connection with the cutting of internal or external circles it is well to bear in mind that material of a substantial thickness can thus be cut. This fact is of the utmost importance when a large hole has to be machined in a thick piece of steel, especially if expensive tool steel is concerned.

For example: A 6 in. bore contour-machined in a piece 6 in. thick saves 48 lbs. of material, in fact all material removed by contour machining any internal outline is intact. A punch and die can be made from the same piece of steel, the slug removed from the die is used for the punch. The old method of producing an internal outline by drilling a row of holes and chiseling off the slug is antiquated, even though material is saved, because contour machining

is at least 10 times faster due to the saw cutting within a few thousandths of an inch from the outline plus the advantage of band filing to precise dimension in the same machine.

The contour machining of Diesel engine connecting rods is not so much a matter of material economy, but the saving in forging die and labor costs and the releasing of a milling machine or shaper for other important work, more than compensate for material economy as applied to some other contour machining operation.

Another interesting connecting rod contour machining application is the operation of machining the bearing to close precision. The old procedure was by boring and slotting; this took seven hours and made the total cost of this particular operation approximately \$25 on a



Precision finishing Diesel rocker arms with band file.

310-lb. rod for a 2500 hp. engine. Two men now execute this work by contour machining in one hour at a total operating cost of \$3.00, thus saving \$22. per piece. The set-up consists of clamping the connecting rod in a fixture fitted to a sub-table which in turn moves the work into the saw. The cut proceeds straight until it meets the radius, the sub-table is then locked and one of the men swings the rod to generate the radius by means of an improvised hand-wheel feed.

Contour-machining heavy wrist pins is another typical Diesel engine contour machining operation where time and material saved, drastically reduced former manufacturing costs. The contour machining of 350-lb. wrist pins, measuring 18 in. long and 12 in. in diameter, is a continuous production job which formerly tied up a very expensive milling machine and results were inadequate because the milling time per piece was 8 hours.

In this operation, all four pieces or slugs are removed in $1\frac{1}{4}$ hr., in other words each double cut requires less than 20 minutes. This production rate is of course made possible only by ingenious means to hold, position and feed the work into the saw. The auxiliary table used is of the roller bearing type, roller bearings operate on hardened steel strips, the table is dust-proof and the feed is mechanical. The auxiliary table has a layout of small holes to simplify the

locating of the work holding fixture for all sawing positions. Once the wrist pin has been properly positioned in the fixture for the first single cut, the remaining seven cuts are thus automatically located by shifting the assembly accordingly. Of particular significance in this instance is the fact that each double cut is 4 in. $\times 2\frac{1}{2}$ in. so every slug cut off weighs approximately 12 lbs. and the material being carbon steel still has considerable value.

The contour sawing machine may be set for band filing a short run job. Band filing does not necessarily mean the work has to be previously contour machined because much work from milling machines, shapers, slotters, etc., may well be band filed most economically. File bands are available in $\frac{1}{4}$ in., $\frac{3}{8}$ in. and $\frac{1}{2}$ in. widths; are flat, half-round and oval in shape and vary in style of cut and number of teeth per inch to obtain any degree of finish in the least possible time. Polishing bands of various grits replace file bands to obtain extra fine finishes. Band files cut from 7 to 8 times faster than hand files and 3 to 4 times faster than jig files; continuous filing means no return strokes so injurious to any type of file but a band file. Another important chapter has been added to contour machining practice with the recent introduction of high speed equipment. The advantages of cutting so many of the materials now industrially used at high and super-high velocities are too important to be excluded

from this article, although this part will be briefly discussed.

The high speed unit is the outcome of long experience along lines of standard type contour sawing machine design, plus extensive research with precision saw bands operated at velocities as much as nine times higher than any ever used with conventional practice. It had been no secret for some time that higher speeds on band saws were the missing link to increased cutting rates and improved quality of work in cutting many of the softer materials. Improved saw bands and machine rigidity and strength to support these cutting tools have merged to definitely solve this problem.

The high speed band saw does not and never will eliminate the standard type machine with its infinitely variable speed range from 50 to 1500 fpm. Low cutting speeds are imperative to cut the thicker steels and their alloys. However, with the new high and super-high velocity range, the high speed machine does not only take on where the standard machine leaves off but relieves the latter of much work to be cut faster and better.

It is obvious that standard contour sawing machines are regularly used to cut such materials as aluminum and magnesium alloys, all the plastics, woods, laminates, etc. At the maximum 1500 fpm. speed of standard equipment, these materials cut at a fair production rate but only at two and three times this velocity can the saw perform at its highest efficiency.

The high speed machine is designed to provide infinite variable speeds from 1500 to 10,000 fpm. and the required velocity within this wide range to suit the nature and thickness of material being cut, makes the new type Buttress saw the fastest and most accurate cutting tool ever offered industry. Although the Buttress type saw is particularly intended for high speed cutting, it performs exceptionally well at much lower velocities and in connection with any make of band saw equipment. Due to their low initial cost and long life, precision contour saws are never resharpened.

It is obvious that when friction cutting any kind of steel $\frac{1}{4}$ in. or less in thickness, saw speed need not be as high as for a $\frac{1}{2}$ in. thickness since there is less material to be softened in the kerf. It is for this reason that a hard steel such as chromium of $\frac{1}{4}$ in. thickness can be economically friction cut at 4000 fpm., while if it were $\frac{1}{2}$ in. the velocity would have to be increased to 9,000 or 10,000 fpm. for similar results.

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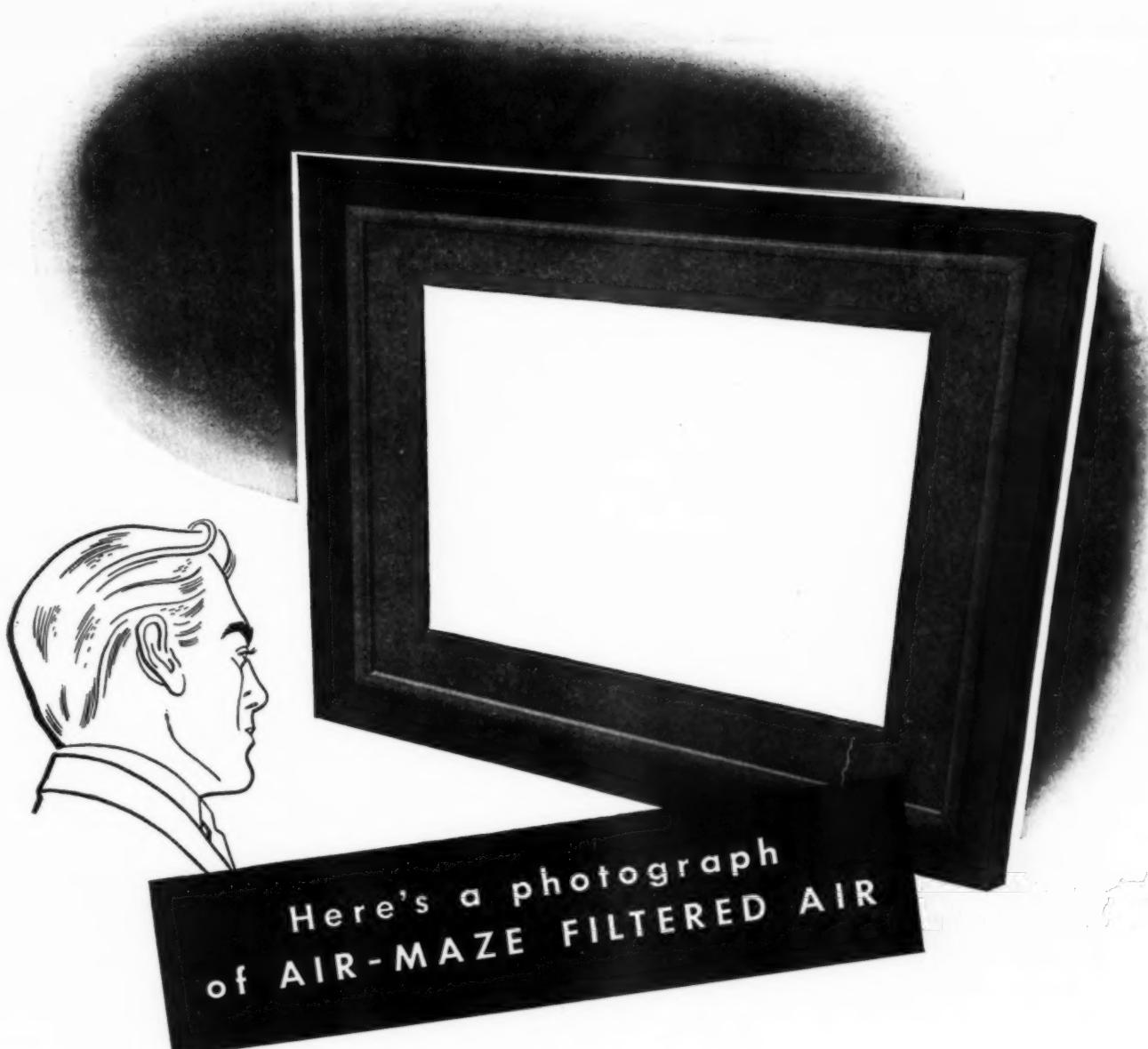
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SUPERVISING & OPERATING ENGINEERS' SECTION

Crankcase Explosions

By GEORGE M. WALTON*



The Author

CRANKCASE explosions may, in a sense, be said to be a product of advancement. It seems inevitable that greater perfection or improved performance in a mechanical device is usually accompanied by new problems. The internal combustion engine is certainly no exception.

Closer tolerances, higher speeds, super-charging and more compact design have not only increased horsepower-per-weight but also have

* Vice President, Engineering, Air-Maze Corporation, Cleveland, Ohio

Worthington gas engine; Air-Maze oil separator seen left of governor.

increased the possibilities of overheated conditions which precede crankcase explosions. Only a relatively few years ago, slower speed engines warranted much less attention to this subject.

An overheated condition in the engine is only one of the two conditions needed for an explosion, i.e., an explosive mixture and ignition temperature. Much attention is being given to this latter factor at the present time. It is generally agreed, however, by all those approached, that the perfection necessary to entirely eliminate ignition temperatures is beyond our immediate reach.

The other condition, namely the existence of an explosive mixture, seems to offer greater possibilities for a rapid solution.

ATTEMPTS TO ELIMINATE OXYGEN UNSUCCESSFUL

Obviously, the elimination of oxygen (air) would accomplish the desired result and this is probably why numerous attempts have been made in this direction. Considerable horsepower has been built with all crankcase openings sealed as well as practicable, and with all breathing outlets sealed in liquid to permit outflow but no inflow. This would seem to exclude the oxygen, but since violent explosions continue to occur, we must accept the premises that oxygen is admitted.

Most engineers concur that there is no such thing just now as a completely tight crankcase, and even if there were, it is possible for a dangerous amount of oxygen to pass the piston.

Actually, all crankcase seals, including piston rings, would have to be perfect to exclude all air.

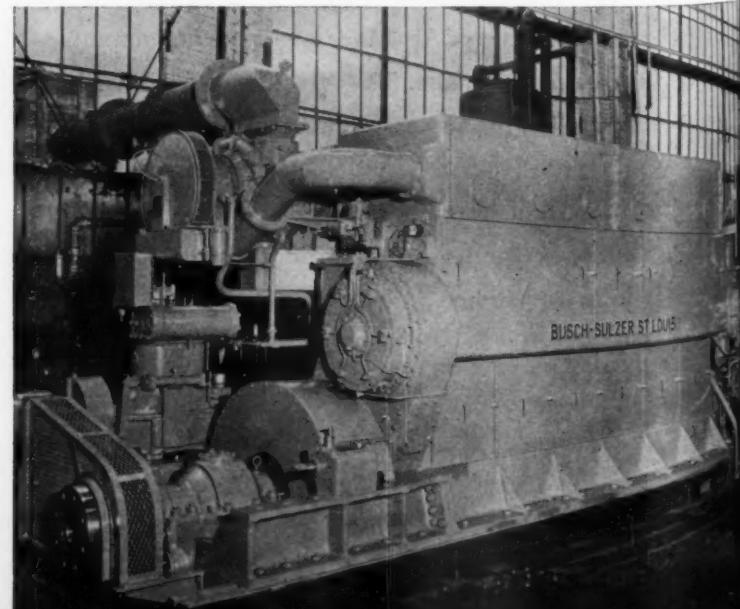
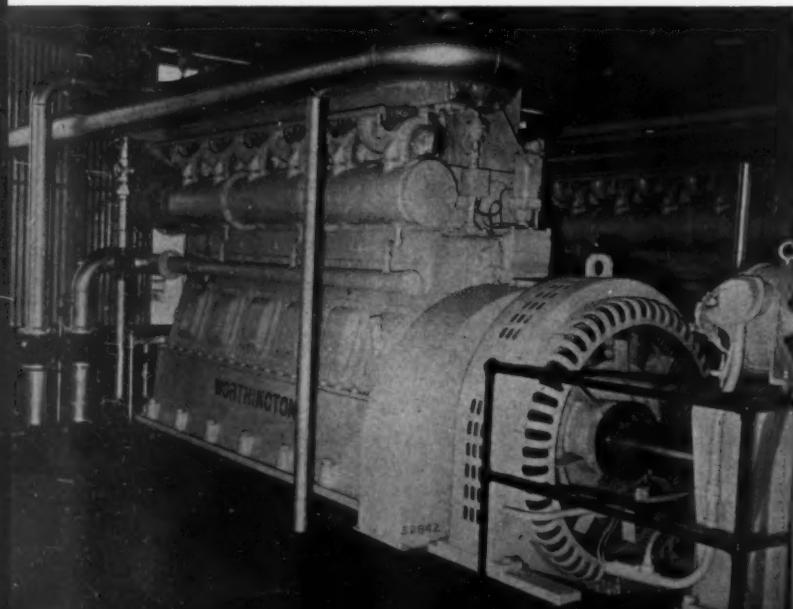
Even engines with vents sealed in liquid offer little protection in this respect. When such an engine is stopped, the cooling of the crankcase gases creates a considerable vacuum in the crankcase, actually drawing liquid up the vent pipe a considerable distance. This depression will be relieved by outside air through any opening short of a positive seal. It is noteworthy that many explosions in such "sealed" engines occur shortly after starting the engine—an indication that oxygen has infiltrated into the crankcase during the cooling period when the engine was not running.

VAPORIZATION OF LUBRICATING OIL

To prevent the presence of combustible gas seems to be beyond accomplishment. Even assuming that there were no blow-by to provide an air-fuel mixture, there is still the ungovernable vaporization of lubricating oil due to excessive heating of mechanical parts. This vaporized oil, when mixed in correct proportions with outside oxygen, provides the other factor necessary for an explosion.

To entirely eliminate crankcase explosions is as yet an ideal. Many engineers, however, believe they can be controlled or even made to serve the operator, and there is a vast experience to substantiate their opinion. Many thousands of Diesel engines operating today have never had . . . And now please turn to page 82 . . .

Busch-Sulzer Diesel fitted with internal type Air-Maze oil separator.



PRODUCERS OF HAMILTON STEAM AND DIESEL ENGINES, CANNON AND THE MACHINE TOOLS TO MAKE THEM



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Exchange Your Diesel Maintenance Ideas

"CONTROLLING PUMP UNITS BY MEANS OF A HOMEMADE FLOATSWITCH"

Conducted by R. L. GREGORY

IN the operation of any power plant, situations often arise which are annoying and cause a lot of inconveniences, but which with a little ingenuity and a few spare parts found about the place, can be quickly eliminated.

In a certain plant the operators were always on the alert while operating the fuel transfer pump, which pumped the fuel from the fuel storage tanks to a service tank. The transfer pump was located in the basement of the plant and pumped the fuel to the service tank, located about thirty feet above the operating floor. From this point the fuel flowed by gravity to the day tank and thence into the units.

This transfer pump was operated by a motor, connected to a magnetic type of switch, operated through push button control. When the operator started the transfer pump, he was obliged to watch the gauge on the service tank and when the tank became full, to stop the pump by means of a stop button. On two or three occasions, situations arose which demanded his attention elsewhere, and the running pump was forgotten, with the result that the fuel tank was filled to overflowing.

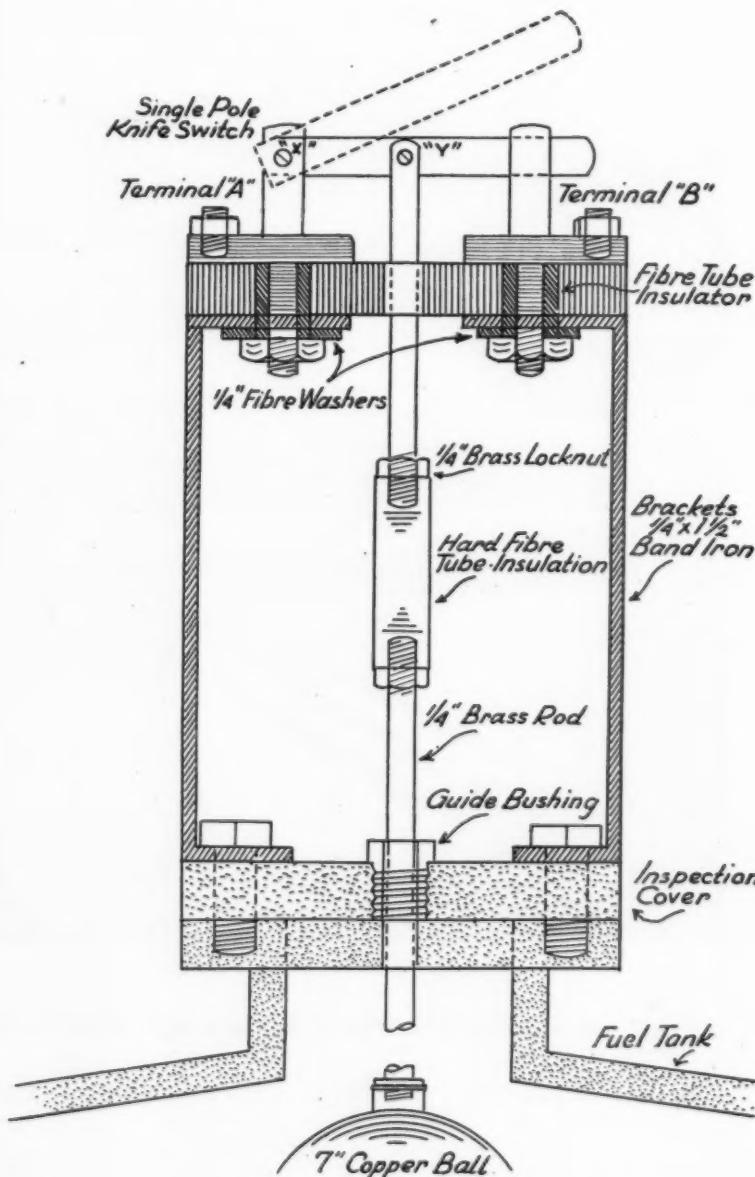
After a couple of such experiences, a home made float switch was made as shown in the accompanying sketch, and the trouble was eliminated. It took only a short time to construct it and mount it on the tank, and once the operator had started his pump, he was free to go about his duties without worrying as to the pump stopping at the proper moment. Such little gadgets are inexpensive and often prove valuable additions to plant equipment.

The brackets were made of $\frac{1}{4}$ in. x $\frac{1}{2}$ in. band iron and mounted on the inspection cover, through which a hole was drilled and a brass guide bushing installed. The control rod was made from a piece of $\frac{1}{4}$ in. brass rod, and an insulating bushing of hard fibre tube installed as shown to eliminate any current getting to the oil. The float was made from an old 7 in. copper float ball. The switch was a single pole knife switch, the terminals of which were mounted on a piece of heavy fibre $\frac{3}{4}$ in. x 2 in and 6 in. long. Fibre insulating bushings were installed around the terminals and washers un-

der the nuts to insulate them from the brackets.

Connections at "X" and "Y" were left free so that when the oil rose to a predetermined height the float ball would rise and break the connection. The terminals "A" and "B" were hooked in series with the holding coil on the magnetic switch, so that the moment this circuit was broken the switch would drop out, shutting down the pump. This switch could easily have

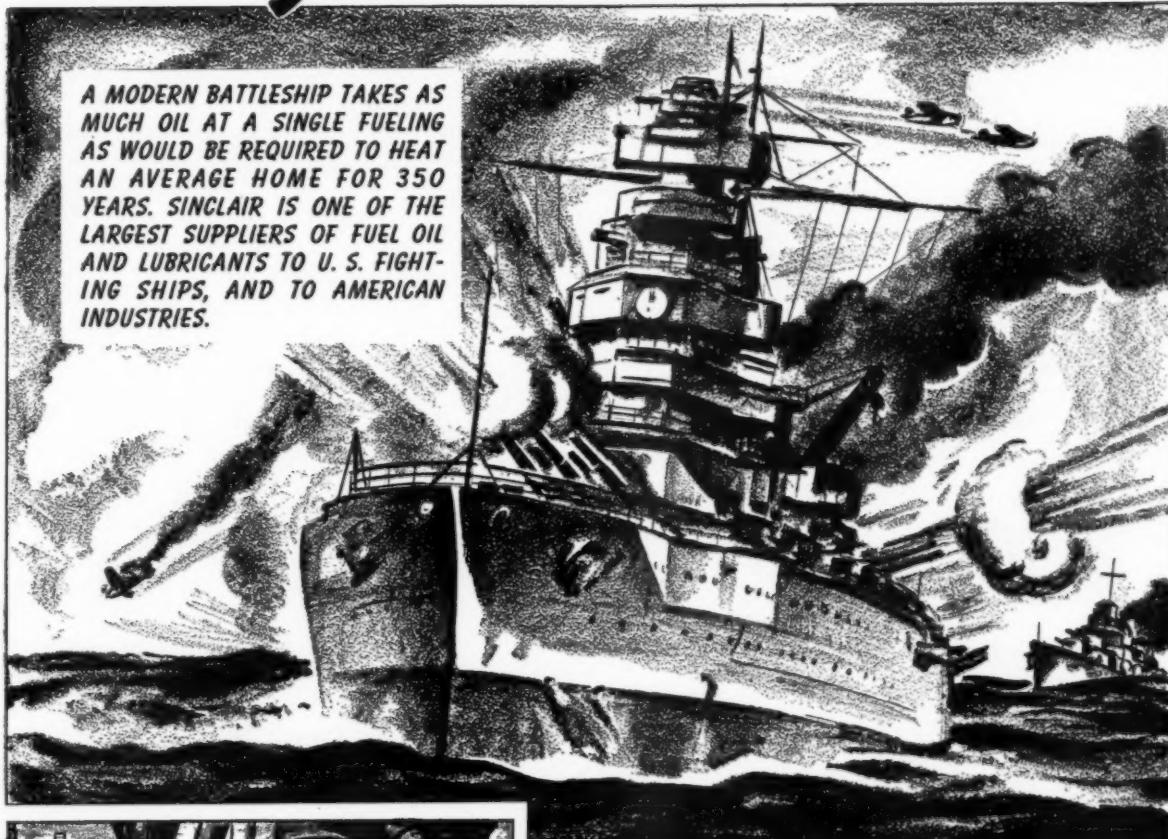
been constructed to also start the pump at a predetermined low oil level, but it was felt that as long as the operator was making his rounds it would be advisable to have him start the pump and then use the above as a safety device to guarantee stoppage of the fuel pump at the proper time. The height of fuel in the tank at the time of stoppage can be determined by varying the length of the $\frac{1}{4}$ in. brass rod, thus lowering or raising the copper float ball.



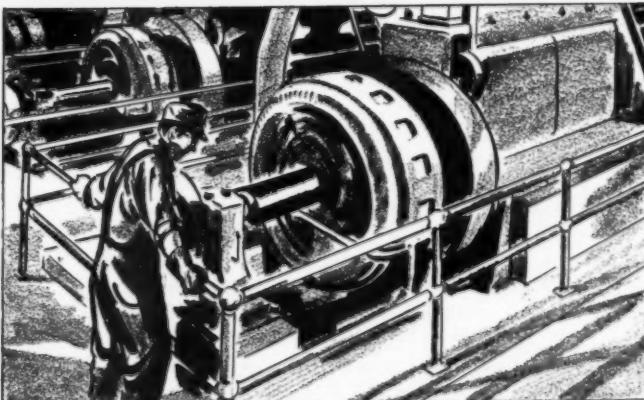
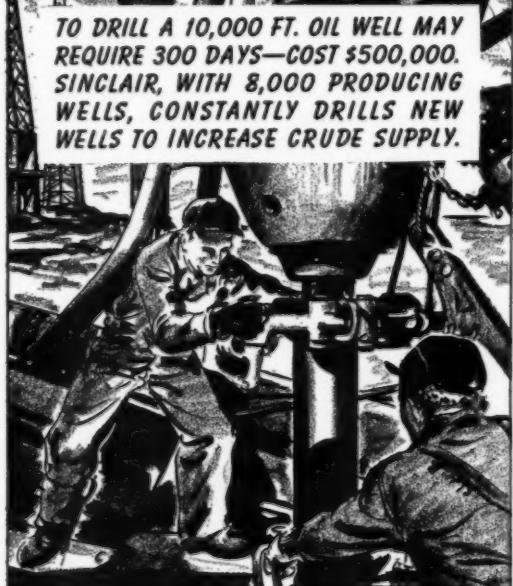
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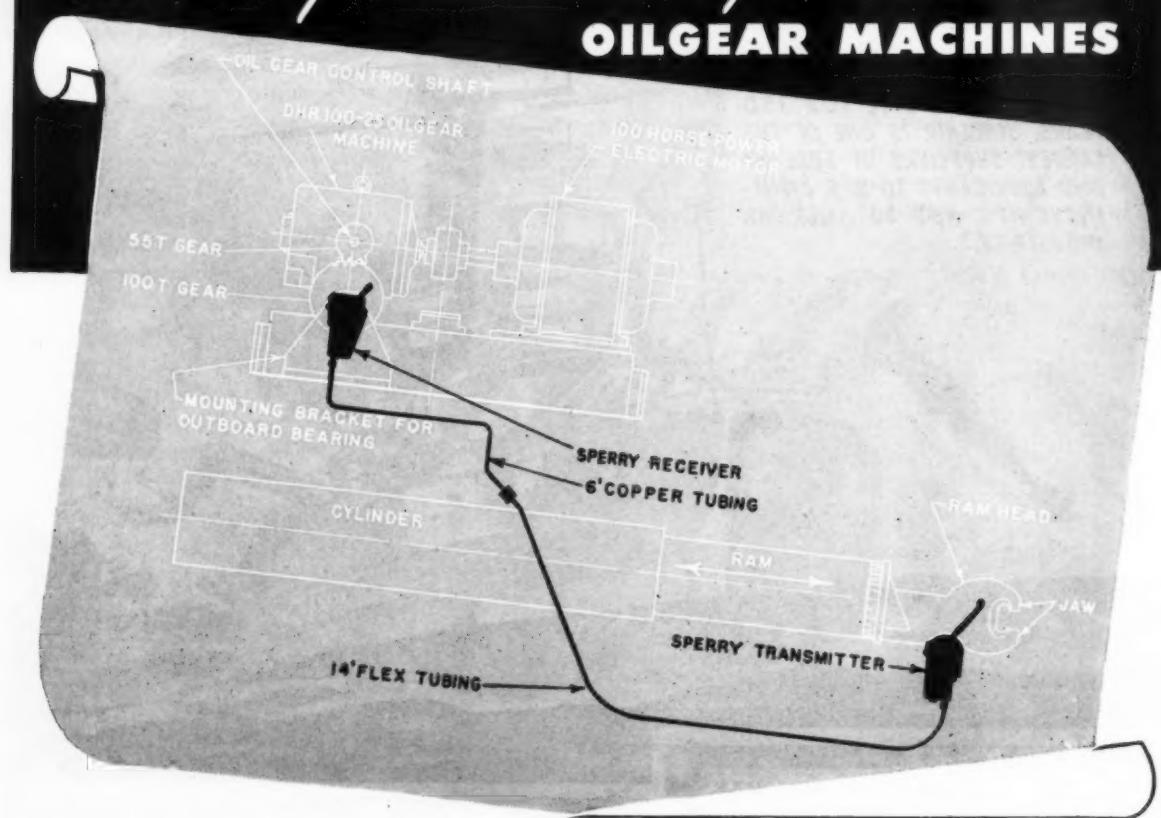


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SPERRY HYDRAULIC CONTROLS
provide Precision Operation of
OILGEAR MACHINES



SPERRY HYDRAULIC CONTROLS are used by the Aluminum Company of America's Massena Plant on a 250,000 lb. Rod and Bar Stretching Machine, as shown above. A Transmitter mounted on the moving Ram Head remains constantly at the operator's hand, allowing him instant control of the stationary Receiver. The motion of the Receiver is transmitted through a gear and pinion to the rotary pilot valve which, in turn, controls the pump stroke of the Oilgear Machine.

APPLICATION: Manual control of speed and direction of motion of Ram Head on Alcoa's 250,000 lb. Rod and Bar Stretching Machine.

PROBLEM: Original installation of mechanical controls presented following difficulties:

- a. Control set-up limited operator's vision.
- b. High-accuracy control unobtainable.
- c. Frequent and expensive maintenance due to complexity of mechanical controls.

EASILY INSTALLED . . . DEPENDABLE . . . ACCURATE
 Send for Bulletin 78 for additional details

SOLUTION: Alcoa changed to Sperry Hydraulic Controls with the following results:

- a. Hydraulic control sensitivity provides precise control.
- b. Operator can watch machine more easily.
- c. Low maintenance and trouble free operation of controls.

The above case-history is typical of the advantages secured by many Machine Designers and Product Engineers when they use Sperry's single-tube system to solve their remote-control problems.

Sperry's Hydraulic Controls minimize design problems by utilizing a single connected tube that can be bent around corners and pillars, and installed through walls and other obstacles, thus reducing installation and maintenance costs.

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DUAL-FUEL ENGINE

Worthington . . . builder of the first American designed solid injection, compression ignition Diesel engine . . . builder of the first American double-acting Diesel . . . the first American 4-cycle dual-fuel engine . . . now announces an outstanding achievement in engine history, the first *supercharged* 4-cycle dual-fuel engine.

Worthington's Dual-Fuel Engines, result of years of experimentation and testing, are instantly convertible from gas to oil, and back again, by the turn of a wheel . . . operate on any proportion of oil and gas, from 5% oil and 95% gas to fuel oil only . . . and are on order and in production today.

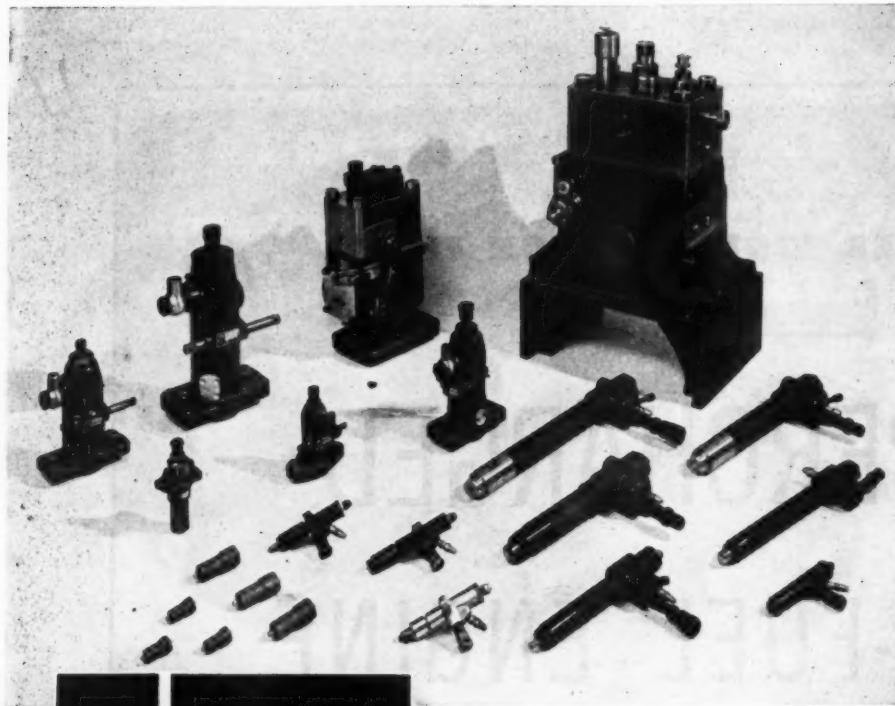
Now . . . another step forward . . . *supercharging* makes possible in a dual-fuel engine the same high thermal efficiencies previously obtained only in supercharged oil Diesels.

Worthington Pump and Machinery Corporation, Buffalo Engine Division, Buffalo, N. Y. Diesel engines, 150 to 3,290 hp . . . Gas engines, 175 to 3,500 hp . . . Dual-Fuel engines, 150 to 3,290 hp.

YOUR PARTNER IN POWER PROGRESS

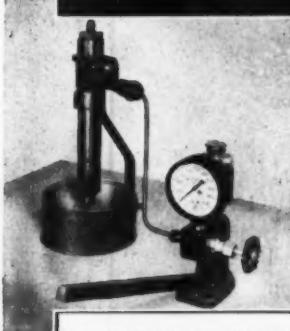
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YOUR SOURCE FOR DEPENDABLE FUEL INJECTION EQUIPMENT



ADECO NOZZLE TESTER

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America's most widely used nozzle tester enables any mechanic to make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Compact, portable, sturdy, precision-built. Pressures up to 10,000 p.s.i. Tests both large and small injectors on bench or engine. Prevents costly delays and possible damage to engine. Standard or Navy-approved gauge. Ideal for testing hydraulic equipment. Write for bulletin.

Whether you need standard fuel injection equipment or special units built to your specifications, Adeco offers the logical source of supply.

Today's line of Adeco equipment, the outgrowth of long experience in serving the Diesel industry, includes: Standard fuel injection pumps in plunger diameters from 7 mm. to 31 mm.; a complete line of standard nozzles and nozzle holders, including the water-cooled type; and the Adeco nozzle tester.

All Adeco products are built to highest standards, with years of trouble-free operation behind them to testify to their reliability.



AIRCRAFT & DIESEL EQUIPMENT CORP.

4401 NO. RAVENSWOOD AVE. • CHICAGO 40, ILLINOIS

New Hydraulic Unit—

...Continued from page 67

HMRS 6 cylinder Cummins Diesels driving a 62 in. x 42 in. wheel.

Results obtained in these installations revealed the following performance characteristics: In maneuvering at 400 rpm., it was possible to go from forward into the same speed in reverse in two seconds with both engines operating, and in three seconds with one engine operating at 400 rpm. This was accomplished without any vibration or noticeable noise of any kind, a feat that would not have been possible without the use of the hydraulic couplings because the rapid engagement of mechanical clutches would have stalled the engines at these low speeds.

These engines operated at 250 rpm. and swung the propeller in either direction without stalling. With engines stopped and coupling drained, it required about one minute to fill the couplings and turn the wheel.

Harry A. Olin Appointed



Harry A. Olin

THE National Supply Company announces the appointment of Harry A. Olin as Credit Manager of the Superior Engine Division. Mr. Olin comes to the company from the Office of Industry Advisory Committees of the Office of Price Administration. Prior to these last two years in Washington, Mr. Olin had twenty-three years in the corporate and municipal banking, investment and credit fields. For eleven of these years he was with the Harris Trust and Savings Bank in Chicago. A graduate of Swarthmore College, he was a First Lieutenant in World War I.

"EXPEDITER" (Jungle Style)

Far up in the headwaters of the Amazon, the jungle is an unfriendly place—particularly for a power launch. Yet, that is where this boat operates—often 600 miles or more from any repair depot. It's a personnel carrier used to expedite rubber shipments.

Obviously, its Diesel engines—and the

starting equipment used on those engines—must be depended on to give unfailing operation. With that in mind, its engineers specified Auto-Lite electrical equipment for Diesels throughout. Significant to anyone interested in Diesel engines is the fact that tough jobs, like this one, almost always call for Auto-Lite electrical equipment.

THE ELECTRIC AUTO-LITE COMPANY

TOLEDO 1, OHIO

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Rubber Development 28' launch. Built by The Wareham Shipyards powered by R. H. Shepard Company. Equipped by AUTO-LITE.



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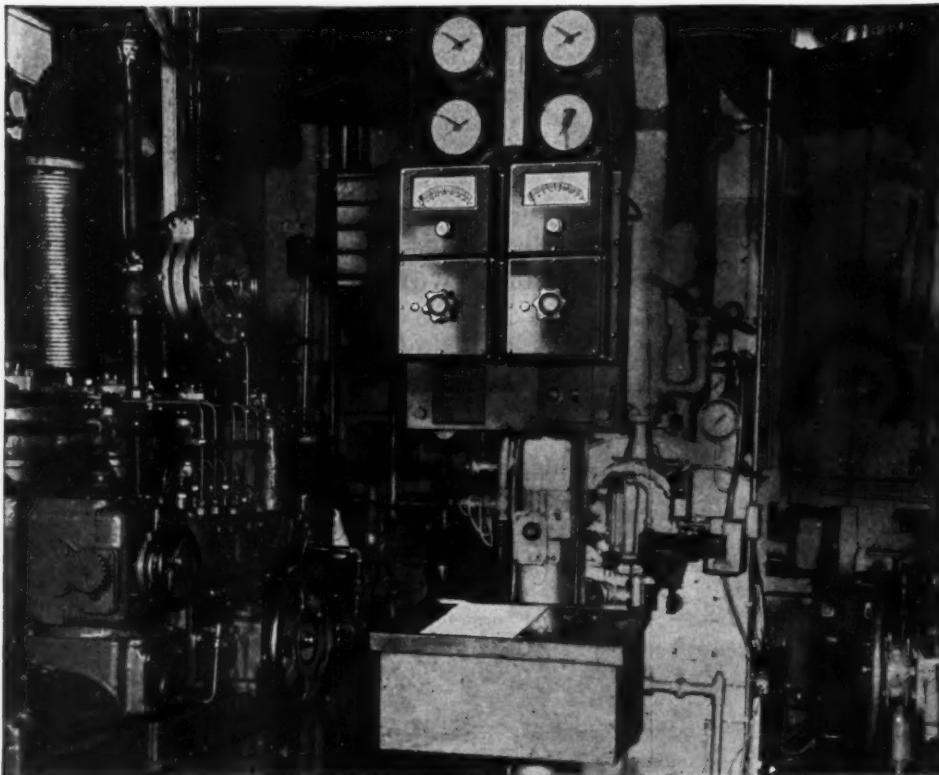
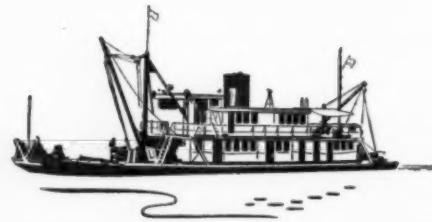
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EXHAUST PYROMETERS



An Alnor multi-point pyrometer is provided for each of the two Fairbanks-Morse main propulsion Diesels

When the Goldenrod was recently equipped with new and larger Fairbanks-Morse Diesel engines, Alnor exhaust pyrometers were selected, providing for a reliable and convenient check of exhaust temperatures at all times. With increased power, exhaust temperature measurements become even more important as a guide to uniform loading, and to check the accuracy of adjustments and maintenance. You will find Alnor Exhaust Pyrometers the choice of experienced operators, afloat and ashore. There are models available for use with Diesel and gas engines of any type and size. Write for Exhaust Pyrometer bulletin with complete data.

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Crankcase Explosions

. . . . Continued from page 72 . . .
a serious explosion. Some of these engines have been known to warn the operator of an overheated condition by emitting light puffs from vents, thus permitting an adverse state to be brought under control without damage. It is even possible to provide a signal which would warn the operator of this condition, but such arrangements are generally thought best omitted.

REPLACING BLOW-BY WITH AIR

Essentially, such engines have a crankcase ventilating system that accomplishes two purposes. First, blow-by and vaporized oil are removed from the crankcase. Second, fresh, dust-free air is introduced in the entire case in quantities sufficient to dilute any air-fuel mixtures so as to reduce or eliminate their explosive characteristics.

As a result, ignition temperatures generated at any one point can cause only minor explosions or "puffs" which are definitely limited in scope and force.

Admittedly, there is a rather nice balance which should obtain in the system designed to scavenge these crankcase gases, especially to secure the fullest advantage. To admit air at proper points and in proper amounts, to secure adequate sweep, to drain the gases to the right point, to carry the correct negative pressure in the case, to prevent the travel of minor explosion puffs, to prevent the removal of crankcase oil with the scavenging air and to regulate all of these with varying engine speeds and power demands should be the problem of someone with long experience on many types of engines.

HAZARDS OF ENTRAINED OIL

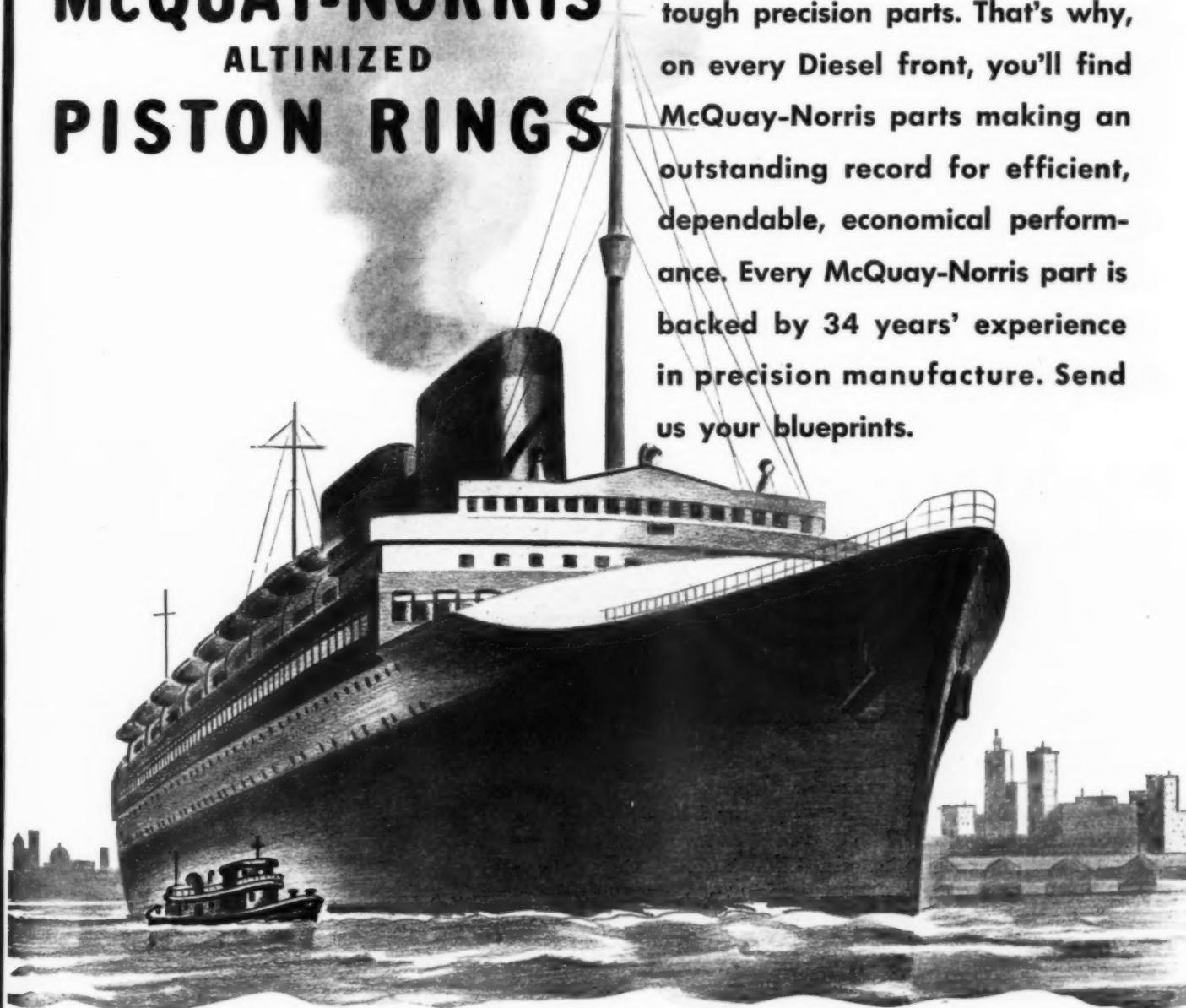
Since there are several means at hand to accomplish crankcase scavenging, it is well to have at least the more usable methods in mind. It is necessary only to have access to a satisfactory source of suction. Possible sources are the minus pressure created at the air intake, a separate suction pump or blower and an ejector of the aspirating variety which may employ either the pressure in the air box or manifold or in the exhaust system. As the last mentioned means may involve change of air box pressure balance, and, ejection to the exhaust line may incur additional problems, we will consider here only the first two methods.

It is apparent that in drawing off the crankcase vapors there is the probability that entrained lubricating oil will be carried with this stream.

Parts built for Toil and Sweat

McQUAY-NORRIS ALTINIZED PISTON RINGS

Diesel engines have tough work to do... and tough work demands tough precision parts. That's why, on every Diesel front, you'll find McQuay-Norris parts making an outstanding record for efficient, dependable, economical performance. Every McQuay-Norris part is backed by 34 years' experience in precision manufacture. Send us your blueprints.



Awarded to two plants
McQuay-Norris Ord.
Management Division

McQUAY-NORRIS MANUFACTURING COMPANY

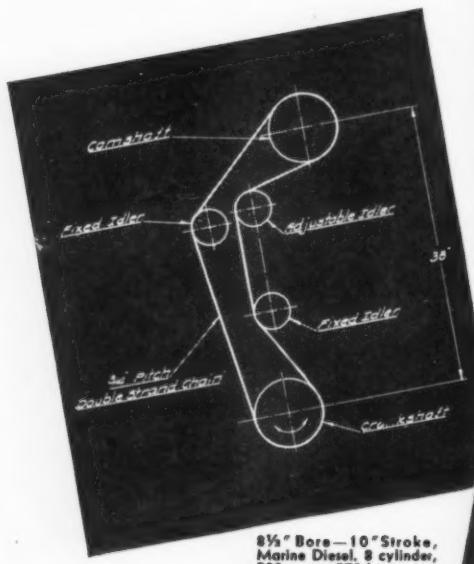
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PRECISION WORKERS IN IRON, STEEL, ALUMINUM, BRONZE, MAGNESIUM

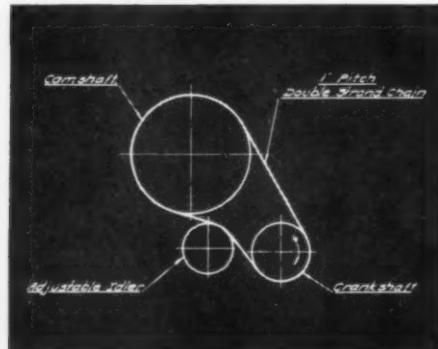


ENGINE DRIVE PROBLEMS

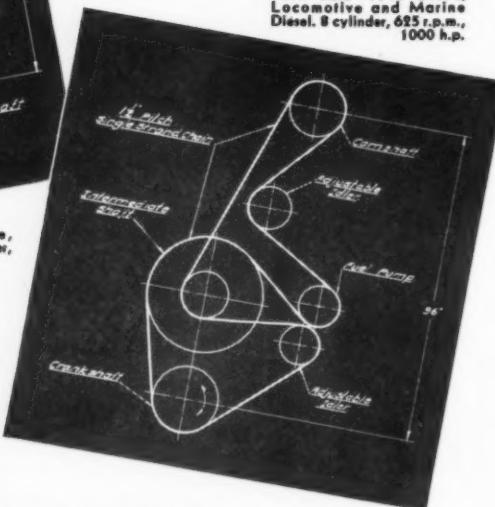
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8½" Bore—10" Stroke,
Marine Diesel, 8 cylinder,
900 r.p.m., 272 h.p.



12½" Bore—15½" Stroke,
Locomotive and Marine
Diesel, 8 cylinder, 655 r.p.m.,
1000 h.p.



18" Bore—22" Stroke, Ma-
rine Diesel, 8 cylinder, 300
r.p.m., 1500 h.p.

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Since the earliest days of Diesel engine progress, Diamond engineers have worked with engine builders in meeting requirements for various drives.

DIAMOND Roller Chain Drives have proved their unusual endurance and high efficiency—operating on land and sea—on engines totalling over five million horsepower.

They require fewer shafts and bearings, facilitating good design. They transmit power by spreading the load over a number of sprocket teeth—eliminate separating force and axial thrusts. They are equally efficient on short or long centers, for high or low ratios. Quietness is a result of accuracy of manufacture, and the cushioning and muting effect of the oil films within the chain. Shafts can be driven in the same or opposite directions.

Diesel engine roller chain applications include timing drives and drives for such auxiliaries as pumps, generators, etc., while in larger capacities chains are used to drive blowers, for power take-off, main generator drives, ship-propulsion,—power transmission up to 1500 h.p.

Diamond Chain engineers are ready to make recommendations that will simplify your engine designs and improve performance. DIAMOND CHAIN & MFG. CO., 407 Kentucky Avenue, Indianapolis 7, Indiana. Offices and Distributors in All Principal Cities.

Catalog 617 mailed on request.



DIAMOND
ROLLER
CHAINS



Positive and proper means should certainly be employed to prevent this loss and danger. Obviously, for economy's sake, it is desirable to prevent loss of lubricating oil, which in many, even well-balanced installations, might reach serious proportions. Beyond this, however, is the possibility of hazard where crankcase gases are returned to the air induction system. In Diesel engines, for instance, should oil be carried into the air box, the accumulation at this point would eventually be carried into the air inlet ports or valves and be consumed as fuel oil. Such a condition would put the engine beyond the speed control usually governed through the amount of oil injected. Thus as the engine increased speed beyond the normal governed rpm., the velocity of air through the air box would increase, as would the suction through the crankcase, and additional quantities of lubricating oil would be drawn from the air box into the combustion chamber, again increasing the speed. Thus a vicious cycle could be started which might result in excessive speed, serious property damage or even loss of life.

In the case where an independent air pump or blower is used as a means of suction, the operator would hardly find it desirable to have a stream or sputter of oil vented into the engine room or even outside the room.

Thus it is essential to have an adequate oil separator properly inserted in the system. A correctly constructed oil separator will collect the oil while permitting air flow without appreciable pressure drop, will automatically return the oil to the oil reservoir or crankcase and will prevent the possible travel of minor explosion puffs to which previous reference was made.

Oil separators for this purpose may be mounted outside the engine or it is a comparatively simple matter to design the separator as an inside integral part of the engine. Both types as illustrated here have their place and are widely used. The internal design is always possible when use of the system is contemplated sufficiently early in the design state and has the advantage of neater appearance.

ADDITIONAL ADVANTAGES OF PROPER SCAVENGING

The result is not only gratifying from the stand-point of hazard reduction but reduces engine sludge accumulation. The continuous removal of moisture formed by combustion is no doubt largely responsible in minimizing sludge.

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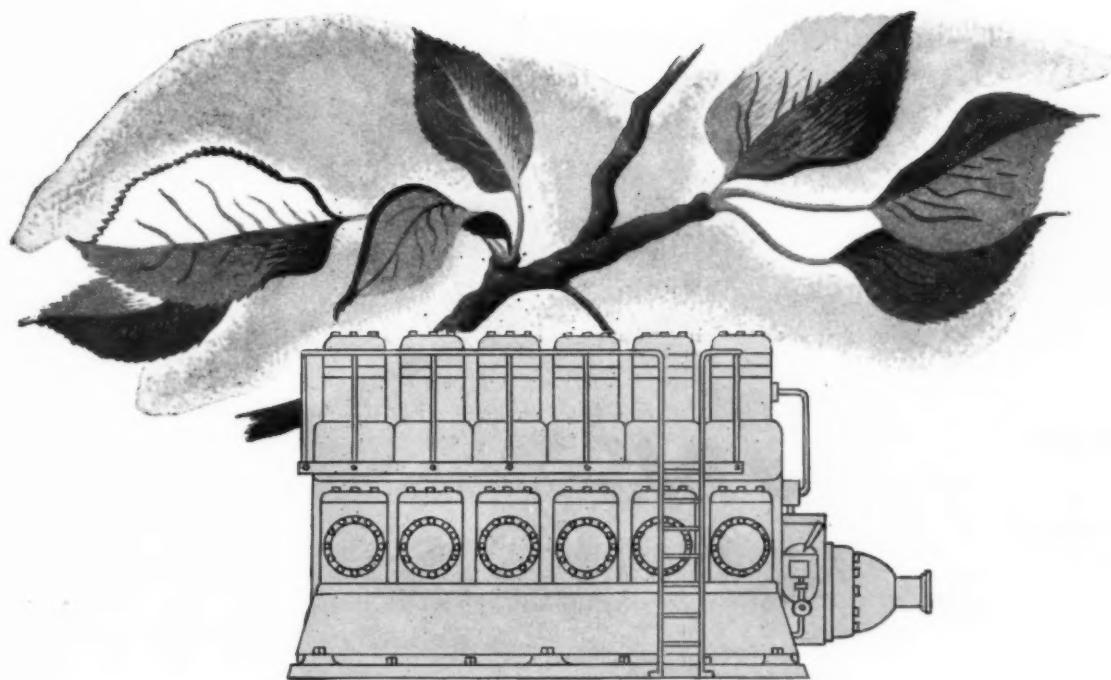
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PROGRESS
MAY 1945



DIESELS

Don't grow on Trees!

You'd probably be in a tough spot if your engine should fail right now—especially in view of the shortage of manpower and critical materials.

Don't take a chance on a breakdown due to burned out bearings, scored cylinder walls, etc.—direct results of inadequate cooling or lubrication. "DL" Engine Safety Controls and Contact Makers, used with a suitable alarm system, will warn of low lube-oil pressure, and high bearing and

coolant temperatures before costly damage occurs.

Specify "DL" Engine Safety Controls and get the same reliable protection afforded the engines of hundreds of our fighting ships.

DETROIT LUBRICATOR COMPANY

General Offices: DETROIT 8, MICHIGAN

Division of AMERICAN RADIATOR &

Standard Sanitary CORPORATION

Canadian Representatives—RAILWAY AND ENGINEERING
SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety
Float Valves and Oil Burner Accessories • Radiator Valves and Balancing
Fittings • Arco-Detroit Air and Vent Valves • "Detroit" Expansion Valves
and Refrigeration Accessories • Air Filters • Stationary and Locomotive
Lubricators.

Due to the negative pressure in the crankcase induced by the crankcase ventilating system, the engine will not leak oil from the cracks and seals saving many man hours of wiping, and the engine room will be entirely gas and fume free, much to the operator's relief.

New Line of Diesel Lube Oils

ANNOUNCEMENT of a new series of Vital Diesel oils, SAE 10 to 50 inclusive, is made by E. F. Houghton & Co. These oils are of the

detergent type embodying highly stable solvent-refined stocks, given a special treatment which renders them resistant to oxidation or formation of sludge or corrosion of bearings.

They conform to U. S. A. Specification 2-104B covering heavy-duty lubricants. Although specially treated, they are said to be competitively priced with other treated oils and with many straight mineral oils. A folder describing vital Diesel oils is available upon request to the manufacturer at 303 W. Lehigh Avenue, Philadelphia 33, Pa.

H. C. Lenfest Becomes Enterprise Vice President

THE appointment of Harold C. Lenfest as Vice-President in charge of Enterprise Engine Company's New York City offices at 44 Wall Street is announced.

Mr. Lenfest comes to Enterprise after long and varied experience in marine and Diesel engineering. Thoroughly experienced in both technical and managerial phases of the Diesel field, he has a broad grasp of power development and application.



Harold C. Lenfest

After graduation from Webb Institute of Naval Architecture and Engineering in 1918, Lenfest became associated with Bath Iron Works. Since then he has held positions with the following firms: Naval Architect for Fabricated Ship Corporation; Southeastern Manager for De La Vergne Machine Company, 1925-1931, Eastern District Manager, Diesel Engine Division, American Locomotive Co., 1931-1945; concurrent with this last position he was Consultant for National Defense Research Committee on Mechanical Engineering and Naval Architecture, 1942-1944.

Mr. Lenfest's understanding of operational problems is shown by the fact he holds an unlimited Chief Engineer's License, Steam and Diesel. Membership is held by the new Enterprise Vice-President in the American Society of Mechanical Engineers, Society of Naval Architects and Marine Engineers, Institute of Marine Engineers (London), and he is Secretary of the Power Cost Report Committee. "Len's" many friends throughout the Diesel industry wish him well in his new association.

A new Star in the TWIN DISC

The new star in their Army and Navy E flag brings a thrill of pride to every employee of the Twin Disc Clutch Company for it is a symbol of their continued and united efforts to speed the production of products essential to our present highly mechanized war.

But while the emphasis is on PRODUCTION, another Twin Disc group . . . the local factory branches and parts depots . . . are also supplying a signal service which should not be overlooked. In spite of the difficulties of maintaining competent personnel, there have been no "fatalities" in the service map. In fact, you'll note that some additions have been made to better serve manufacturing customers and owners of Twin Disc Clutches and Hydraulic Drives in various essential industries, bringing the total field organization to 9 direct factory branches and 30 parts and service representatives. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

Reduction Gear Power Take-off Marine Gear

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U.S. PAT. OFF.

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

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ROGRESS

MUSKEGON Type
DB "Double Bevel"
Oil Ring

Parallel
beveled
lands

Wide slot
ventilation

effective
oil control with
adequate lubrication

Heavy duty design attains usually conflicting objectives!

To control oil and still to lubricate adequately—thus is stated a design problem that has long defied solution.

In the heavy-duty engine field the Muskegon type DB oil ring has an enviable record of success in solving this problem. It is useful in both Diesel and gasoline engines for truck or other "work-horse" tasks.

The wide-slot ventilation openings are radiused to retard carbon and sludge accumulation. The cylinder contacting lands are relatively narrow for effective oil scraping. The annular channel is formed as part of the contour of the lower beveled land which affords a direct passage for return oil to the crankcase.

The parallel beveled lands permit the ring to ride over the oil film on the up-stroke of the piston, spreading the lubricating film evenly over the cylinder surfaces. Conversely, on the down-stroke double scraping action is provided. Muskegon type DB is made in widths from 5/32" to 1/2"—diameters up to 9". It is regularly supplied with Muskegon Graphitox coating for quick and scuff free break-in. Type DB may also be used with a steel expander.

Muskegon engineers are ready always to help in the selection of the correct ring type for any piston ring need.

MUSKEGON
Piston Rings

MUSKEGON PISTON RING CO.
MUSKEGON, MICHIGAN
PLANTS AT MUSKEGON AND SPARTA

The "Peoria Plan"

AN outstanding problem today is that of returning men and women from the armed forces to their former jobs. Caterpillar Tractor Co., Peoria, Ill. whose workable rehabilitation program prompted the original idea for the nationally known "Peoria Plan," discusses its answer to the challenge thoroughly in a new booklet, "Back On The Job."

The publication concludes with a summary of the "Caterpillar" program and a step by step

outline of how veterans are returned to their jobs. A picture story illustrates the various steps. To receive a copy of this interesting and timely booklet, request form 8870.

Fairbanks-Morse Employees Benefit in Annual Profit-Sharing Fund

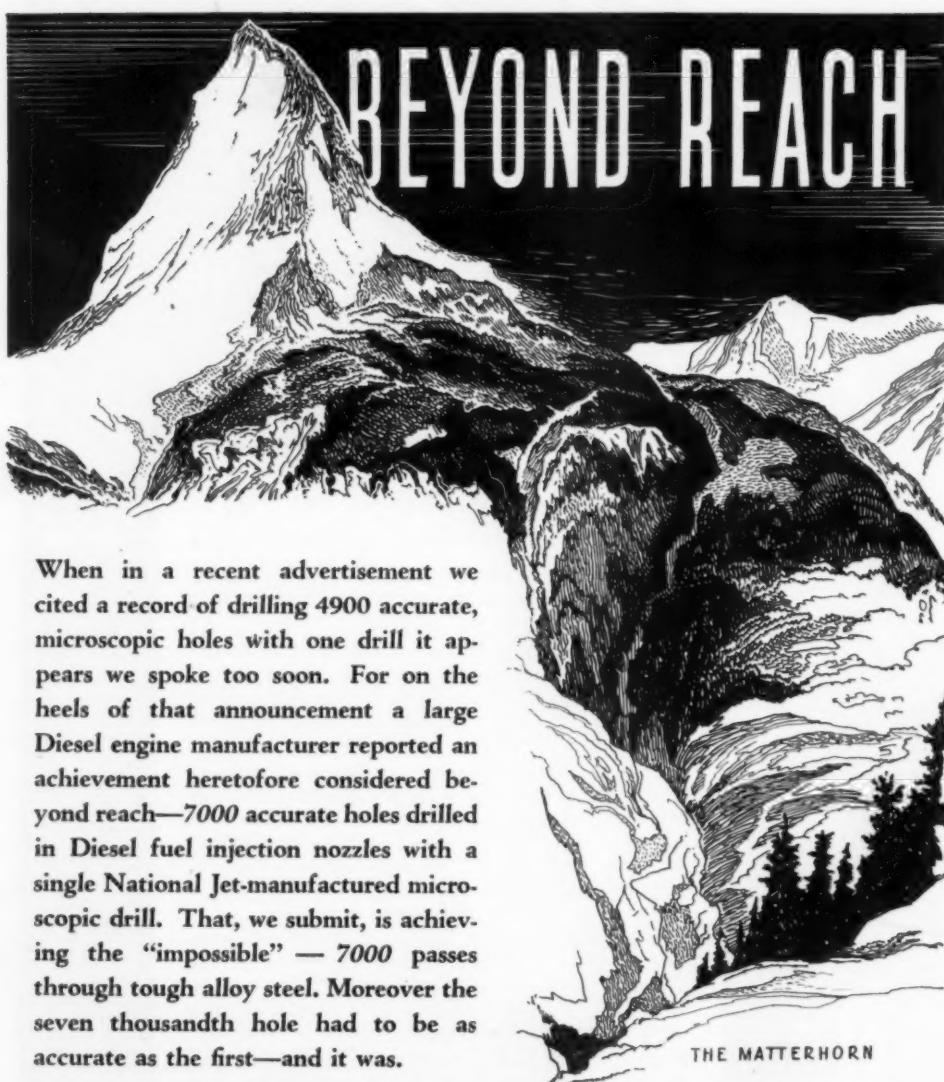
OFFICIALS of the Fairbanks, Morse & Co., Chicago, have announced that over three-quarters of a million dollars have been set aside

out of 1944 profits to be distributed to eligible employees, under the company's profit-sharing plan which has been in vogue for a number of years. The exact amount so set aside totals \$776,880.16.

The company's financial statement also discloses a net profit for 1944 of \$2,845,729 after provision had been made for a special contingency reserve of \$2,500,000. With this addition of \$2,500,000, the company's special reserve for contingencies at December 31, 1944 amounted to \$6,450,000. Net profit after contingency reserve was at the rate of \$4.75 per common share, compared to \$4.65 per share earned in 1943. Dividend disbursements during the year were \$2.50 per share.

I-R Issues New Angle Compressor Bulletin

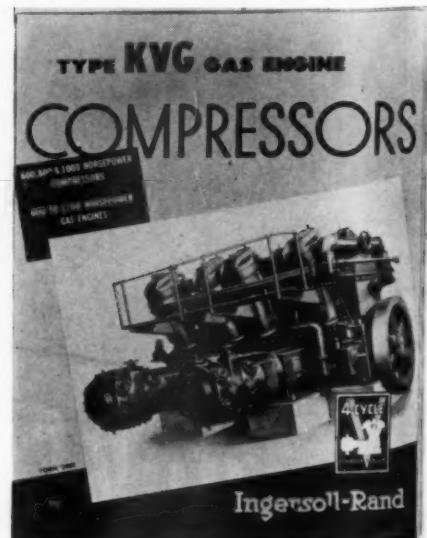
INGERSOLL-RAND announces a catalog describing KVG compressors. These machines add to the line of 4-cycle V-angle type gas-engine driven compressors which the company created and introduced to the oil industry in 1932. They marked the break with the customary horizontal models of that day. This is a complete and instructive book. It lists the basic features and advantages of the KVG, 2-page cross-sections of end and longitudinal views, and full specifications which are clearly explained.



THE MATTERHORN

"Precision And Durability As Defined By Webster"

National Jet Company
115 MILTON PLACE CUMBERLAND MARYLAND

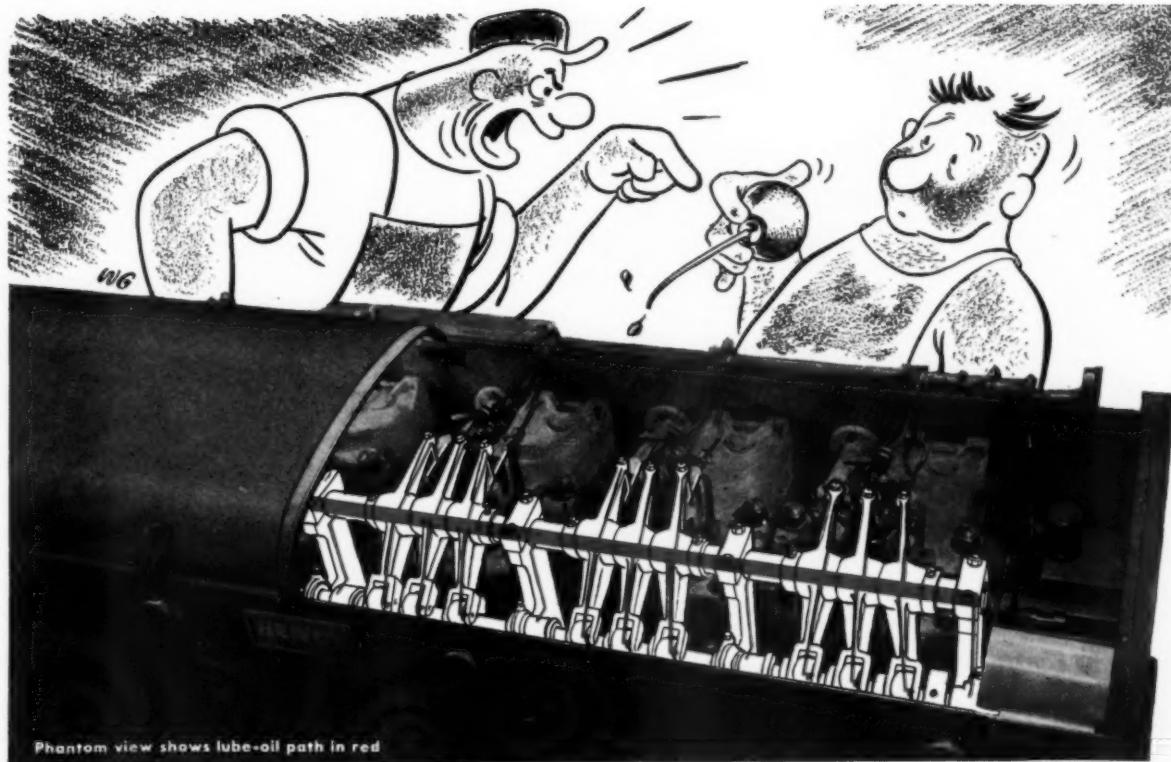


The KVG is shown to be available in 5 models, ranging from 600 to 1000 hp. The 800 hp. model is offered with either two or three compressor frames, the 1000 hp. model with three or four. The extended range permits the selection of a unit best suited to each job. The PKVG, a gas engine for power needs, is a companion model, having the same engine as those

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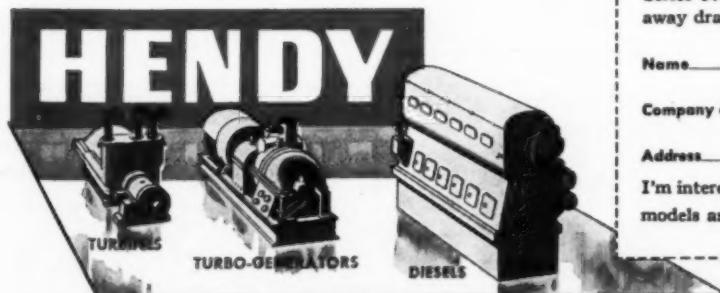


"Put DOWN that oil can, Lube-oil Reuben!"

No need to hand-oil any part of a Hendy Series 50 Diesel! It's completely enclosed, so *all* parts are oiled from the pressure-lubrication system . . . automatically . . . in correct amounts, neither too much nor too little.

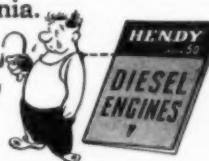
Series 50 Diesels have advantages never before combined in a single design. Besides full pressure lubrication, they have overhead cam-shafts, unit fuel pumps and injectors, oil-cooled pistons, and many other features.

Now, for the first time, you can have the benefit of *all* these features in one tested and reliable Diesel. For complete information, mail the coupon today to Joshua Hendy Iron Works, Sunnyvale, California.



Send for NEW Diesel Booklet
No Obligation

JOSHUA HENDY IRON WORKS
SUNNYVALE, CALIFORNIA



Mail me your new booklet that completely describes the Series 50 Diesel, with photographs and cross-section cut-away drawings showing the design of all major parts.

Name. _____ Position. _____

Company or business. _____

Address. _____

I'm interested in Marine Stationary Diesel-electric
models and in hp ranges from 190-250 from 250 up

160-D-17

of the compressor units, except that it is more compact, due to the omission of compressor cranks and frames. It ranges in size from 600 to 1200 hp. in 6, 8, 10, and 12 cylinder models.

Several pages of installation photographs show the KVG compressors in a number of industries and give an idea of the immense volume of work done in the field for which they were designed. Write the company at 11 Broadway, New York 4, New York or one of its country-wide branches, for Form 3081.

Wix Accessories Corp. Adds To Its Official Family

THE Wix Accessories Corporation of Gastonia, N. C., has recently announced new appointments among its executive personnel. William S. Barfield, Jr., the treasurer of the Wix organization has been named a vice-president and will continue as treasurer. Paul C. Crawshaw, Wix Western sales manager, has also been made a vice-president. Leon G. Alexander has been advanced to assistant treasurer.

New Tachometer Bulletin

THE Herman H. Sticht Co., Inc. has just issued a new tachometer bulletin No. 760 describing the monel J triple range hand tachometers of centrifugal type. Two new tachometers have been added to the line of triple range hand tachometers, namely: the catalog No. 1412 which combines in one instrument all speeds from 100-12,000 rpm. Another new number is, catalog No. 315 which makes this instrument suitable for all speeds from 300-15,000 rpm.

FOR NEW INSTALLATIONS REPLACEMENTS OR CONVERSIONS

In thousands of marine and stationary installations, Buckeye Diesels are doing mighty good jobs—the kind of jobs their owners take pride in telling you about—the kind of job you want YOUR next Diesel engine to do for YOU.

The Buckeye catalog explains, in easily understandable detail, how a Buckeye Diesel combines precision construction with economical power and dependable operation. Your copy will be sent on request.

**Stationary and Marine
Propulsion (Direct
Reversing) Engines
150 - 900 H.P.**

**Marine Auxiliary
and Stationary
Generator Sets
100 - 600 KW**

THE BUCKEYE MACHINE CO.—LIMA, OHIO

• ENGINE BUILDERS SINCE 1908 •



These are instruments with an accuracy of 1% of full scale reading, designed for heavy duty service. All these tachometers are completely ball-bearing and require no lubrication. A copy of Bulletin 760 will be mailed on request to Herman H. Sticht Co., Inc., 27 Park Place, New York 7, N. Y.

Maritime Day—May 22nd A Proclamation

WHEREAS, in Public Resolution 7, approved May, 1933, it is stated that on May 22, 1819, the steamship *The Savannah* departed from Savannah, Ga., on the first successful trans-oceanic voyage under steam propulsion, thus making a material contribution to the advancement of ocean transportation; and,

Whereas, by said resolution the President of the United States is authorized and requested annually to issue a proclamation calling upon the people of the United States to observe May 22 of each year as National Maritime Day;

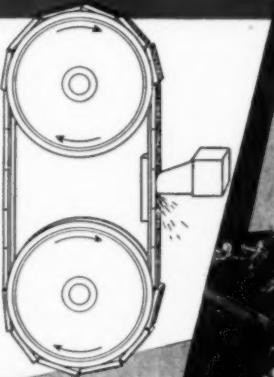
Now, therefore, I, Franklin D. Roosevelt, President of the United States of America, by virtue of the authority vested in me, do hereby issue my proclamation calling upon the people of the

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2 WAYS TO REMOVE FLASH Both Do ALL

You can do it on the DoALL Contour Machine or on a DoALL Band Filer. Both accommodate the $\frac{3}{8}$ " File Band which finished these metal statuettes at the rate of one per minute.

The DoALL method is a smooth, continuous, one-way operation with no loss of time, motion or energy. Today's fastest way to finish parts or products made from metals, alloys, plumbatals. And, it's 4 times faster than jig filing. 9 times faster than hand filing.



Contour Machine—Thousands are in use today shaping parts used in important war equipment. Although used primarily for internal and external sawing, file bands are included as standard equipment with each DoALL Contour Machine.

Band Filer—For continuous filing here's the best solution—a variable speed precision machine that accommodates work up to 6" thick. The 18" square work table tilts for angle filing. Occupies only 27" x 34" floor space.

Send for your copy of circular BAND FILING TO PRECISION TOLERANCES



Do ALL

INDUSTRY'S NEWEST TOOL OF PROGRESS

CONTINENTAL MACHINES, INC.
1381 S. Washington Ave. • Minneapolis 4, Minn.

Minneapolis, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Orlando, Philadelphia, Pittsburgh, Providence, Seattle, Somerville, Rockford,

United States to observe May 22, 1945, as National Maritime Day by displaying the flag at their homes or other suitable places, and I hereby direct that government officials display the flag on all government buildings that day.

FRANKLIN D. ROOSEVELT

Sperry Marine Division Receives Maritime "M"

VICE Admiral H. L. Vickery, USN, vice chairman of the United States Maritime Commission and chairman of the Board of Production Awards, has notified the Marine Division of the Sperry Gyroscope Company that the first gold star for the Maritime "M" pennant has been awarded the Division.

The "M" pennant and Victory Fleet flag were presented Sperry's marine unit on September 21, 1944, in recognition of notable achievement in the production of precision instruments vital to the safe and efficient operation of ships of the U. S. Merchant Marine.

New Dragger Joins Fishing Fleet

THE *Molly and Jane*, first of the new fishing dragger fleet constructed by Wheeler Shipyard,

Brooklyn, New York, for Captains Leon H. Easterbrooks and George Silva of Edgartown, Massachusetts, has completed trial runs and has landed from her maiden voyage with her first catch. Powered by a fresh water cooled Buda-Lanova Diesel engine, 171 hp., 1879 cu. in. with 2 to 1 reduction gear and front end power takeoff, the *Molly and Jane* is assured of ample power for all purposes.



New 60 ft. Wheeler dragger powered with a Buda-Lanova 171 hp. Diesel.

From basic designs by Eldredge-McInnis, Inc. of Boston, Mass., this exceptionally rugged vessel with 60 ft. O.A. length, 16 ft. beam and 7 ft. 6 in. draft was designed for continuous offshore service year 'round. She is considered one of the strongest and best constructed 60-

footers ever built, being well fitted and fastened.

New V-belt Drive Bulletin

AN unusually complete V-belt drive bulletin—with all of the required information to make correct drive selections reduced to handy charts tables and drawings—has just been released by the Allis-Chalmers Mfg. Co. Newest V-belt drive product covered in this Texrope drive engineering summary is the Company's new "Magic-Grip" sheave, designed for fast, easy mounting and dismounting. A quick-picture story of the sheave and complete facts for applying are offered.

Another section covers the Texrope "Econograph" method of drive selections, now widely used where drive designing is frequently necessary. Most important considerations in the design of any V-belt drive—driving sheave diameter and belt size—are readily arrived at with the aid of the Econograph. List prices, stock sizes, dimensions, and construction details are included for all Texrope drives. Additional descriptions cover the application of Texrope Vari-pitch sheaves and drives and the Vari-pitch speed-changer. The new catalog, B6051E, may be obtained from the Allis-Chalmers Mfg. Co., Milwaukee 1, Wisconsin.



VORTEX sets a new high for B.T.U. heat recovery

Any Diesel owner in need of steam or hot water would do well to investigate the VORTEX Heat Recovery Silencer.

It is not "just another" heat recovery device.

It is a compact, 4-function unit which—because of its exclusive, perfected method of heat conduction—operates most efficiently in its primary purpose of spark arresting and silencing, at the same time producing steam or hot water at a rate

believed impractical until now.

At an engine exhaust temperature of 550° and a boiler pressure of 15 lbs. gauge, steam can be generated in the VORTEX Heat Recovery Silencer varying from zero to better than 1 lb. per BHP per hour.

Hot water production, too, is comparably high—the basic heat recovery being better than 1200 BTU per hour.

Get the facts. Write for a copy of our Bulletin No. 732.

VORTEX HEAT RECOVERY SILENCER FOR INDUSTRIAL AND MARINE DIESELS

Manufactured by

ENGINEERING SPECIALTIES CO., INC. • 39 CORTLANDT ST., N.Y. 7

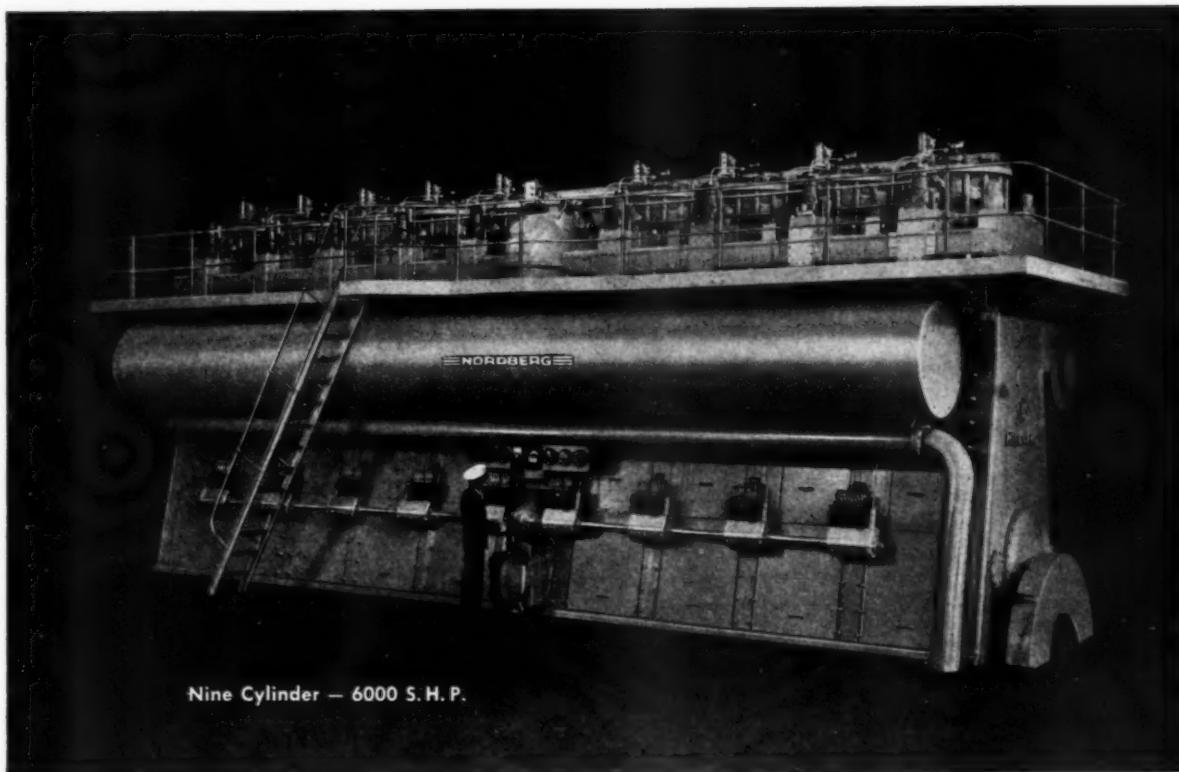
Other VORTEX Products

SILENCERS (Wet or Dry Types) • SPARK ARRESTERS
SPARK ARRESTER SILENCERS • DUST CATCHERS • STEAM SEPARATORS

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NORDBERG MARINE DIESELS

meet these qualifications

DEPENDABLE Proved in wartime service

SIMPLE Preferred by operating personnel

ACCESSIBLE Working parts easily maintained

COMPACT More power in less space

RUGGED Built for heavy duty service

Don't say DIESEL-
say NORDBERG

Nordberg marine Diesels are furnished for direct or gear drive
in sizes up to 8000 S.H.P. in a single unit. It is not too early
to think about dependable Nordberg propelling units for
that fast, efficient fleet of motorships for postwar shipping.

NORDBERG MFG. CO., MILWAUKEE 7, WIS.

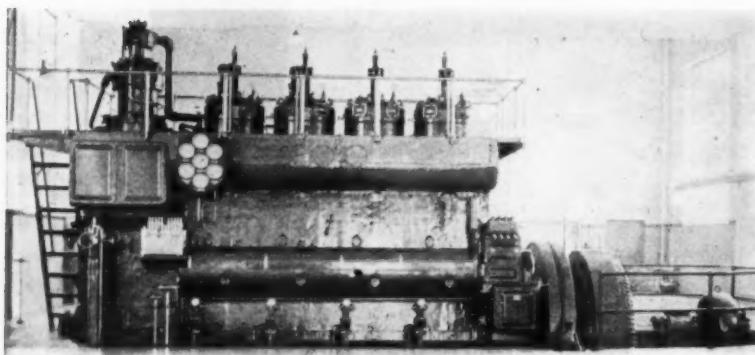


A Remarkable Record

ENGINE CAUSES ONLY 10 MINUTES SERVICE INTERRUPTION IN 19 YEARS

Neodesha, Wisconsin has three Nordberg Diesels, two of which are 550 hp., 2-cycle units, the third engine being an 880 hp., 2-cycle unit. The April, 1942 issue of DIESEL PROGRESS carried a full description of the Neodesha plant with its outstanding operating record up to that time. Herewith we reproduce Superintendent, Lafe Pippin's 19-year record of interruptions in electric service, showing that of a total of 2 hours and 35 minutes "Off the Line," only 10 minutes of outage was attributed directly to an engine. In the light of this record it is understandable why Neodesha has placed its order for a new 1620 hp. Nordberg Diesel to handle its increasing power demand.

The Nordberg 880 hp. Diesel installed at Neodesha in 1934



G. T. HANFORD
DIRECTOR

L. C. BRINER
DIRECTOR OF WORKS AND PUBLIC UTILITIES

C. A. WILCOX
CHIEF ENGINEER OF PLANT

THE CITY OF NEODESHA

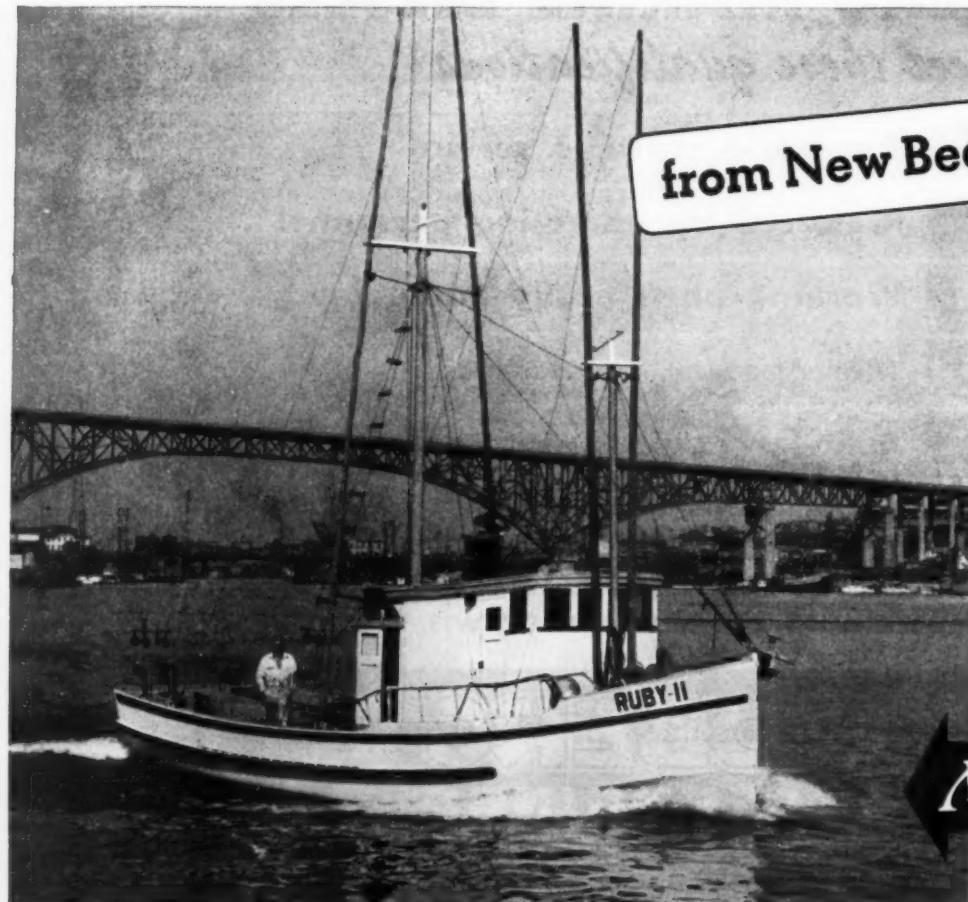
S. G. HAMILTON, CITY CLERK
PHONE 760
NEODESHA, KANSAS

LAFE PIPPIN, SUPERINTENDENT & ELECTRIC SUPERVISOR
A. M. HEDBERG, CITY ENGINEER
WALTERS, DIRECTOR, CITY CHAMBER OF COMMERCE
R. W. DAVIS, CITY ATTORNEY
D. M. RUSSELL, CITY CLERK
G. O. PIPERSON, FIRE CHIEF
G. D. BURGESS, CITY FIREMEN
GEORGE LARSON, LINEMAN

Interruptions in Electric Service

1925 - None.	
1926 - None.	
1927 - None.	
1928 - None.	
1929 - None.	
1930 - February - - - - 5-Min.	Voltage regulator dropped lead.
1931 - None.	
1932 - None.	
1933 - February - - - - 10-Min.	Hot Scavenger Cross Head, bearing too close.
1933 - March - - - - 15-Min.	Water in Fuel Oil
1933 - August - 1-Hr. 40-Min.	Change Buss Bar on Switch Board for New Diesel Engine on Sunday.
1935 - None.	
1936 - September - - 5-Min.	Platinum Points on Regulator Stack, dropping lead on September 4, 1936, 2:30 P.M.
1936 - September - - 20-Min.	Fuel Valve stuck on the Light Fuel Oil Tank, September 5, 1936, 10:30 A.M.
1937 - None.	
1938 - None.	
1939 - None.	
1940 - None.	
1941 - None.	
1942 - None.	
1943 - None.	
1944 - None.	
19-Years	2-Hrs. 35-Min. Total

*Rafe Pippin,
Superintendent*



from New Bedford to Ketchikan...

New Bedford's in Massachusetts, and Ketchikan's in Alaska . . . These two fishing towns, thousands of miles apart, differ in climate and differ in sea conditions. But this one thing they have in common . . . many of the finest boats in *both* harbors are *powered by Mack*.

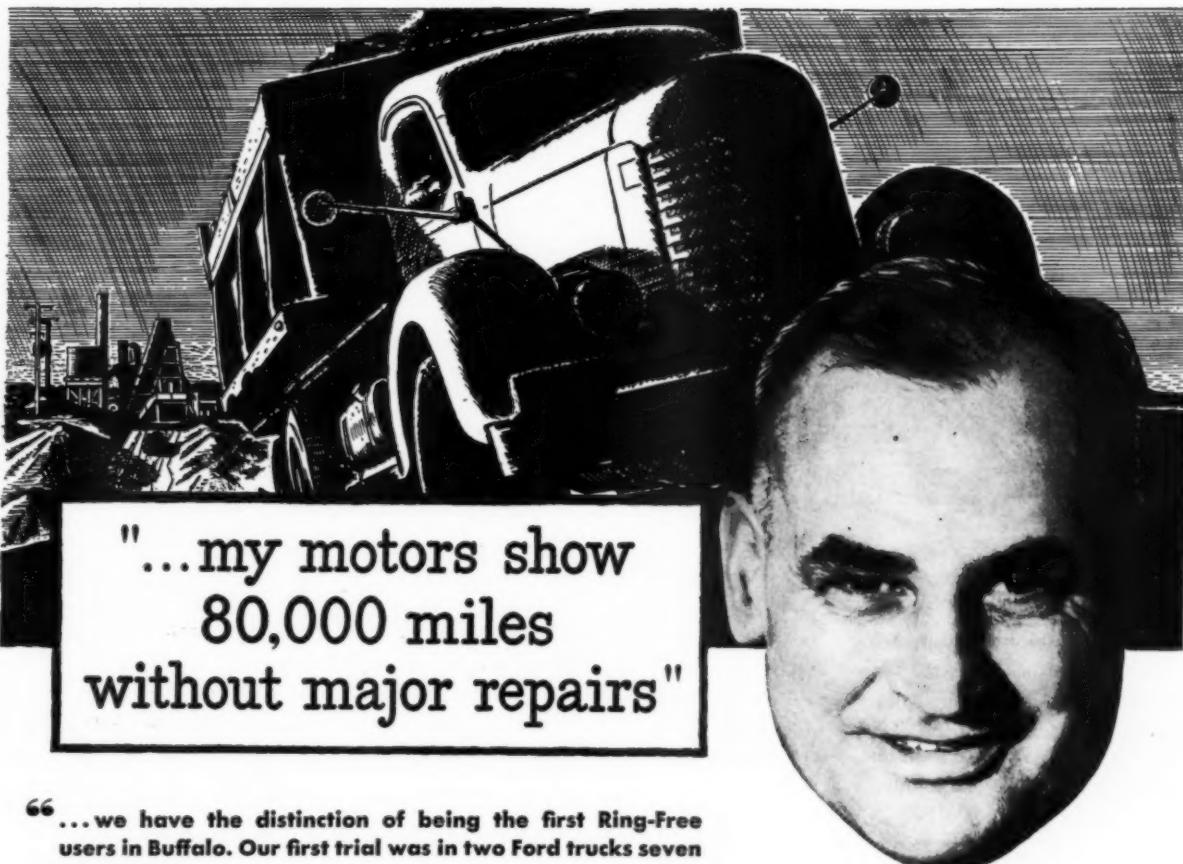
The boat in this picture is the RUBY II, owned by John Siefert of Ketchikan, Alaska. She is 42' long, with a beam of 12' and depth of 5'6". And of course her engine is a Mack Diesel, with a three-to-one reduction gear, and it turns a 38" x 26" propeller.

MACK MANUFACTURING CORPORATION
MARINE ENGINE DIVISION, EMPIRE STATE BUILDING, NEW YORK 1, N. Y.

Mack DIESEL MARINE POWER



Mack Marine Engines Are A Product Of The Builders Of World-Famed Gasoline and Diesel-Powered Trucks, Buses and Fire Apparatus.



"...my motors show
80,000 miles
without major repairs"

"...we have the distinction of being the first Ring-Free users in Buffalo. Our first trial was in two Ford trucks seven years ago.

...our fleet has increased to fourteen trucks including Autocars, Internationals, Fords and one Chevrolet.

...trucks are all used in hauling sand and gravel...the hardest kind of work on trucks as roads are bad...loads are heavy. Due to conditions there is a constant uneven strain on motor bearings.

...if Ring-Free did not have a tough film strength that protected these bearings my motors would not be able to show 80,000 miles without major repairs as many of them have.

...Ring-Free's ability to penetrate even to the top of the pistons and keep the upper rings free gives my motors all the power they were intended to have.

...my first International truck went 110,000 miles with only \$50 repairs...proper lubrication was responsible."

Excerpts from letter of—

George Muehlbauer
205 Courtland Avenue
Buffalo, New York



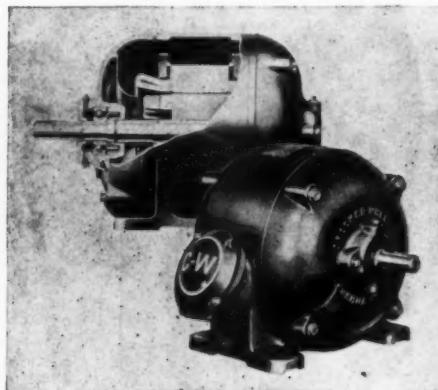
Operators of all types of equipment report lower-cost, more efficient performance with Ring-Free Motor Oil. Find out how Ring-Free can help lick your toughest lubrication problems. ...Phone or write the nearest Macmillan office.

MACMILLAN PETROLEUM CORPORATION

50 W. 50th Street, New York 20 • 624 So. Michigan Avenue, Chicago 5 • 530 W. Sixth Street, Los Angeles 14 • Copyright 1945, Macmillan Petroleum Corporation

New Protected Type Motor

A NEW motor, combining the surplus capacity of the conventional open motor with protection against dripping liquid, falling metal chips and other foreign matter, has been developed by the Crocker-Wheeler Division of Joshua Hendy Iron Works.



Crocker-Wheeler Protected Type Motor

Rated 40 C rise, full-load continuous duty, with a .15 per cent service factor, Protected-Type Motors provide added protection at open motor prices. At present, these motors are available in sizes up to and including the 284 frame. Mounting dimensions conform to the standards

of the National Electrical Manufacturers Association.

There are no openings in the frame or shields above the horizontal center line. This, together with the shielded construction of the ventilating openings, makes Protected-Type Motors suitable for machine tool and similar applications where other types of enclosures have been required in the past.

Pesco Announces Organization Changes

RECENT organization changes affecting the sales department have just been announced by N. M. "Dutch" Forsythe, vice president of PESCO Products Co. (a division of Borg-Warner).

Ed S. Moreland has been promoted to general sales manager. Al E. Wilson has been named assistant sales manager for the automotive division covering PESCO's new "Univac" brake intensifier and "Hydrolease" clutch actuator units for trucks and buses. Ray G. Holt has been transferred from engineering to the sales department taking on duties as a field representative.



C. M. Smith

C. M. Smith is a new addition to the staff of field representatives. His former connection with Higgins Aircraft, Curtiss-Wright and various government projects have given him a wide engineering background which equips him well for his new work with PESCO hydraulics and other accessories. Smith received his engineering training at Vanderbilt and Tennessee universities.

1576 ENGINE HOURS ... on one recharge set



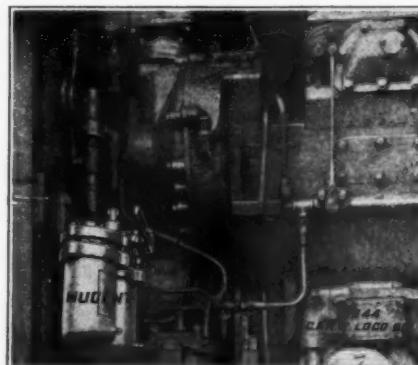
"No. 901"—a 900 h.p., 2-cycle Diesel switcher moving variable loads around curves and up and down ramps—recently operated 1576 engine hours without replacing the absorbent filter recharge in its Nugent Duplex Fuel Oil Filters. During this time 283,680 gallons of fuel oil were filtered and the engine consumed 8,012 gallons. The balance of the oil was bypassed back to the storage tank.

That's the kind of filtering that means maximum Diesel engine efficiency and the ultimate in oil conservation.

Get full details on the complete line of Nugent Fuel and Lube Oil Filters . . . write for Bulletin No. 7A.

WM. W. NUGENT & CO., INC.
EST. 1897
415 N. HERMITAGE AVE., CHICAGO 22, ILL.

... and perfect filtration. That's the performance record of a NUGENT Duplex Fuel Oil Filter installed on the Diesel switching locomotive shown at left.



The above view shows the Nugent Duplex Fuel Oil Filters installed in the Diesel locomotive shown at the left. The throw-away type filter recharge used in these filters is easily and quickly inserted in the filter cage, assuring the user of constant, thorough filtering.

NUGENT FILTERS

A NEW
MAINLINER



with new controls,
new performance,
new flexibility

Powered by two, 4-cycle, 1000-hp. Baldwin diesels, the nation's newest high-speed Mainliner, adaptable to both fast-schedule freight and passenger service, recently completed its trial runs. Each diesel is direct-connected to a Westinghouse generator.

The new locomotive is an "A" unit. Completely self contained, it is used where power requirements do not exceed its rated capacity. For heavier service, two "A" units are coupled together back to back, forming a 4000-hp. locomotive which operates equally well in either direction. For still heavier service, a "B" unit (without cab) may be coupled between two "A's", forming a 6000-hp. combination.

A number of advanced features and refinements are designed into the Mainliner: air throttle control, which eliminates complicated linkage and electrical equipment

and also permits control from either cab at will, when units are in tandem; wheel slip protective device, which automatically throttles down the power if wheel slip occurs in starting; thermostatic control to maintain proper engine temperatures for peak efficiency; chrome-plated liners, which multiply liner life, and reduce ring difficulties. Basic design and equipment has been proven in the hundreds of B-W switching and transfer locomotives now serving on 60 railroads.

On the rails, on the sea, or in the plant, you can depend on Baldwin diesel engines. The Baldwin Locomotive Works, Locomotive & Ordnance Division, Philadelphia, Pa. Offices: Philadelphia, New York, Chicago, Washington, Boston, Cleveland, Detroit, St. Louis, San Francisco, Houston, Pittsburgh.



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EL PROGRESS

MAY 1945

J. Don Campbell, veteran pilot of PESCO, has been given additional territorial assignments in connection with his duties as field representative.

New Type of Flow Indicator

FISCHER & Porter Company describes the Rotasight Flow Rate Indicator. This little instrument is replacing Bull's Eye Sight Flow Indicators because it indicates the flow rate, and it is very compact and comparatively inexpensive.

The Rotasight operates on the rotameter area-type principle and has a V-ported transparent metering tube with a float which rises in direct proportion to the flow through the meter. The catalog is profusely illustrated, and describes construction details and applications of the instrument in a very clear manner. It also gives engineering dimensions, flow capacities and prices.

One of the most interesting applications described is the use of the Rotasight as a flow rate alarm. The manufacturer claims that it is

the only alarm that is operated by flow rate changes only and which is equally sensitive at all points in its flow range because of its straight line calibrations. In writing, ask for Bulletin 92-C, Fischer & Porter Company, 911 County Line Road, Hatboro, Penna.

Dr. Price Joins Oakite



Dr. Donald Price

DR. DONALD PRICE, well known for his research work on wetting agents, synthetic detergents, water repellents and sulphonated oils, and formerly associated with the Interchemical Corporation and National Oil Products Co., has been appointed Technical Director of Oakite Products, Inc., in connection with this company's plans to broaden and expand its technical service facilities to the many industries it serves. Dr. Price will direct the activities of Oakite's engineering and chemical staff including its Research Laboratory and Technical Service Department. Dr. Price is Vice President of the American Institute of Chemists, Councillor of American Chemical Society, member of the Executive Committee, American Branch, American Institute of Chemists and various other professional societies.

An advertisement for Michiana Oil Filters. On the left, a man in a suit and tie is shown from the side, holding a large cylindrical oil filter element. He appears to be working on a large industrial engine or filter housing. To the right of the image, there is text.

WHEN SERVICING
MICHIANA
OIL FILTERS

REPLACE
THE ELEMENTS
WITH

MICHIANA
ELEMENTS

Made in capacities from 163 h.p. to 3266 h.p. Element No. SA12900 is 6½" diam. by 29½" high.

Miciana Oil Filters made to new Navy standards from 100 to 2000 h.p. with identical elements. Element No. SA14900N is 7½" diam. by 18" high.

INSURE "NEW" FILTER PERFORMANCE

You can always have the maximum oil filter performance and efficiency—equal to that of a new filter—if when servicing you always use MICHIANA replacement filter elements.

MICHIANA Oil Filters are protecting millions of horsepower of engines all over the world, daily proving their high dirt-absorbing and oil-cleaning efficiency. To insure this performance, be sure when servicing that MICHIANA Elements are used. MICHIANA PRODUCTS CORPORATION, Michigan City, Indiana.

MICHIANA
OIL FILTERS



Get to know this button.

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Company, 90
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The sea and the beachhead make a real test of fighting and enduring qualities. The picked men who man and fill our landing craft are a new and incomparable fighting force—our Beachbusters—the world's finest by far.

These medium tanks are land marauders but nothing wet stops them.

Industry's "Sunday Punch" f.o.b. BEACHHEAD

Wherever the enemy lurks . . . beyond surf, swamps, streams, or flooded areas . . . our invaders are moving in with equipment carrying special purpose pumps of highest efficiency . . . and other special purpose devices engineered, manufactured and delivered by the Marine Products Co., on schedule.

These adaptations of the BEACHBUSTER'S pumps and other special Marine Engineered Equipment go ashore in hard-hitting juggernauts built for our invading forces by America's production giants.

We'd like to tell you more of developments significant to our Industry and to others filling home front needs and postwar requirements, as well as fighting necessities for all fronts.

MARINE PRODUCTS CO.

6636 CHARLEVOIX AVE. DETROIT 7, MICHIGAN

American Marines actually fielded and flung back Jap grenades. Got those Amtracs ashore and out again. We Help Keep 'em Floating under all conditions.

own for his synthetic de-
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Aircraft Engines of the World, 1945

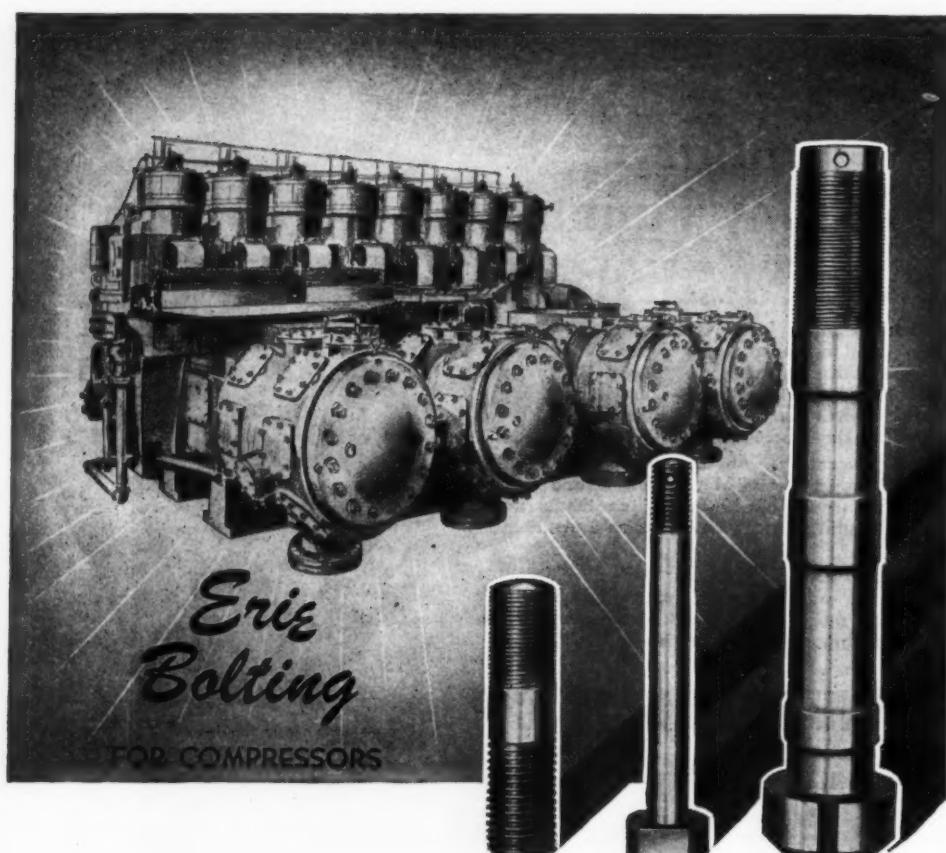
AIRCRAFT Engines of the World, 1945 edition, is the third volume of this international reference book. It contains complete data on all the latest aircraft engines of the United States, Great Britain, Australia, France, Germany, Italy, Japan and the U.S.S.R. It also includes jet propulsion engines and airborne auxiliary power plants. The contents have been revised as of January, 1945, and much of the material is exclusive.

Statistically, the 1945 edition of the book contains 352 pages compared with 320 pages for 1944. This increase has been made necessary to provide space for important new features. The standardized engine data section comprises 122 aircraft engines with full page photographs. Of this total, 37 data pages and 56 photographs are new, and 38 data pages contain major revisions. Approximately 60 per cent of the data pages and 45 per cent of the photographs in the standardized engine data section have been changed for 1945, apart from the additional

features which have been added. Author and publisher, Paul H. Wilkinson, 216 E. 45th Street, New York, N. Y. Price \$8.50.

W. R. Persons Named Assistant Sales Manager

THE appointment of W. R. Persons as assistant sales manager has been announced by J. F. Lincoln, President of The Lincoln Electric Company, Cleveland, Ohio, world's largest producers of arc welding equipment. In his promotion to this new post, Mr. Persons will act as assistant to C. M. Taylor, vice president and general sales manager.



SEND YOUR
BOLTING SPECIFICATIONS
TO A SPECIALIST

ERIE is manufacturing bolts and studs to the exacting specifications of many compressor builders. We are equipped to work with any material heat treated and threaded to specification and machined to specified tolerances. Consult with Erie Bolt & Nut Company for your next requirements.

ERIE BOLT & NUT CO.
ERIE, PA.
STUDS • BOLTS • NUTS ~ ~ ALLOYS • STAINLESS • CARBON • BRONZE



W. R. Persons

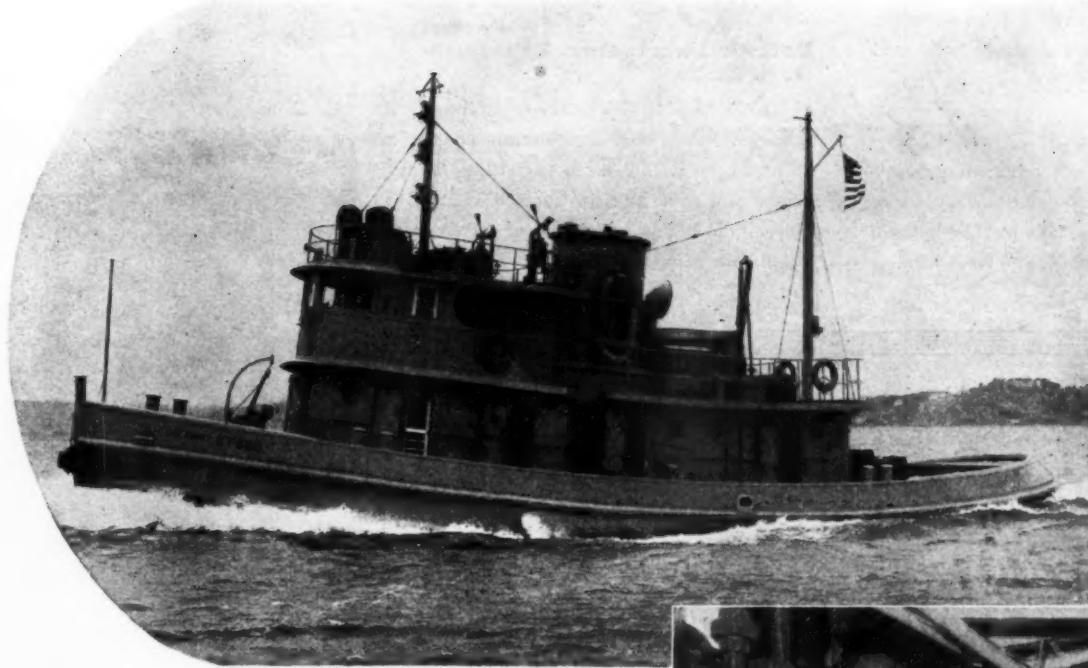
Among his activities concerned with the advancement and supervision of the entire Lincoln sales program, Persons will assume the responsibility of developing certain specific fields for Lincoln products. In this connection he has been working on special assignments since his transfer to the Lincoln home office at Cleveland several months ago. He is also chairman of the firm's Junior Board of Directors. Mr. Persons has been with the company for the past ten years.

Briggs Clarifier Appoints New Distributor

THE Briggs Clarifier Company announces the appointment of another industrial distributor, LaGrave and Company, 812 1st National Bank Annex, Mobile 6, Alabama. LaGrave and Company will handle distribution of Briggs products in central and southern Mississippi, in southern Alabama, and in northwestern Florida.

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CLARK "MD" DIESELS Power Fleet of ST Tugs

Advanced diesel engine design combined with time-proved Clark 2-cycle dependability feature this new Marine Diesel now offered by Clark Bros. It is designed for heavy duty, with extreme ruggedness and simplicity of operation and maintenance. Cold starting, it operates with a wide range of fuel oils. It is one of the smoothest running diesels ever built.

Built in either Port or Starboard types in four, five, six or eight cylinders, 300 to 1,000 B.H.P.

Write or wire for complete information.

CLARK BROS. CO., INC., OLEAN, N. Y.
New York • Chicago • Tulsa, Okla. • Los Angeles
Boston • Houston, Tex. • London • Buenos Aires



Installed in Army ST tugs, the Clark "MD" Diesel, by reason of its simple design, has given a minimum of trouble even in the hands of relatively unskilled operators.

CLARK
ONE OF THE DRESSER INDUSTRIES

{ MARINE DIESEL
2-CYCLE ENGINE

New Hydraulic Press Bulletin

CUSTOM-BUILT hydraulic presses in any style up to 100-ton capacity are featured in a new bulletin just announced by John S. Barnes Corporation. Both vertical and horizontal models are illustrated with emphasis on expertise in design resulting in compact, space saving design; rigidity of structure; ease of operation; simplicity of controls; self contained hydraulic system and complete coordination of structural and actuating elements. The bulletin offers complete engineering counsel on hydraulic

press problems. For a copy of Bulletin No. 501-P and full particulars write John S. Barnes Corporation, Rockford, Illinois.

Detroit Lubricator Appoints R. S. Paltz

E. J. DOUCET, General Sales Manager, Detroit Lubricator Co. has announced the appointment of R. S. Paltz as Advertising Manager effective April 1, 1945, to succeed W. H. Hohmeyer, who becomes Manager of the company's Oil Burner Controls Division.

Mr. Paltz, who has been connected with the Advertising Department for several years, had close association with the promotional activities of all the company's products in the refrigeration, heating and industrial control fields.

Two Cooper-Bessemer Veterans Are Promoted



C. M. Bovard

PROMOTION of C. M. Bovard from the position of Chief Draftsman to Design Engineer and the elevation of Ralph H. Schlosser to Chief Draftsman is announced by The Cooper-Bessemer Corporation, Diesel engine and compressor manufacturer.



Ralph H. Schlosser

Mr. Bovard is a veteran of 20 years of service with the company and Mr. Schlosser has served in the company's drafting room for 31 years.

Diesel Should Be Fertile Field for Returned Vets

AMERICA'S Diesel engine industry, like numerous others has become greatly expanded as a result of the demands of war, and should be a fertile field for employment of the returned veteran.

"The postwar period should bring with it markets for the Diesel engine which of necessity were overlooked almost completely before the war," declares Carl H. Vaupel, assistant general

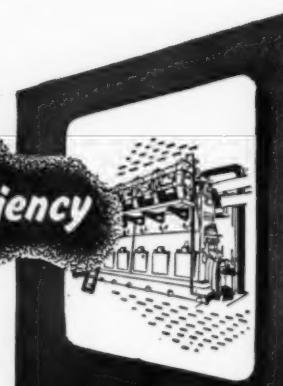
DIRTY FUEL OIL DESTROYS Diesel Engine Efficiency

Every operator knows that when pumps or injection parts become worn, proper combustion is seriously impaired. Improper combustion means lowered engine efficiency and increased maintenance in lapping pumps and reconditioning injection parts.

The tolerances in fuel oil pumps and injection parts are so precise that even the most microscopic abrasives will cause damaging wear. It is not a matter of straining out the nuts and bolts, but *all abrasives, regardless of size, must be removed*.

Many fuel oil filters now in use as both standard and auxiliary equipment on diesel engines are not capable of removing damaging abrasives. The relative efficiency of fuel oil filters is graphically presented in Figures 1 and 2 below.

FIG. 1—Micro-photo shows 45 times enlargement of the abrasives in one cc. of refined fuel oil. Sample taken after it had passed engine filter ready for injection. Chemical analysis showed—Moisture 3.5%, sediment .035%, tarry matter .0475%.



Results of conventional
strainer type filter



Results accomplished by
Honan-Crane Fullers Earth
fuel oil Purifier

It is important that any operator of diesel engines check the efficiency of his fuel oil filtering or purifying facilities. Proper combustion will quickly pay for the change to an efficient fuel oil filtering system.

Honan-Crane fuel oil purifiers are available for direct connection or bulk station use for the purification of both refined and crude fuel oils. Write for complete information and engineering bulletin on purification of Diesel Fuel Oils.

HONAN-CRANE CORPORATION

Subsidiary of Houdaille-Hershey Corporation

305 WABASH AVENUE, LEBANON, INDIANA

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DIESEL PROCESS

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E-M GINEERED A-C GENERATOR CONTROLS

Individually engineered to the same high standards typical of E-M built generators for nearly a half-century, E-Mgineered generator control offers the kind of dependable performance only specialized experience can provide.

Matched to your generator characteristics, E-M generator and distribution switchboards are expertly designed. Switchboard apparatus is of highest quality, and there's adequate clearance for inspection and maintenance. These generator controls are available for all types of engine-generator service to provide an efficient, dependable power plant. You'll find it helpful to get the recommendations of the E-M engineer when you buy generator control.

**ELECTRIC MACHINERY
MANUFACTURING COMPANY**

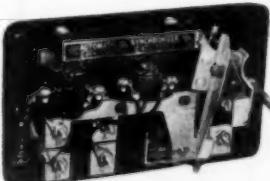
Minneapolis 13, Minnesota

SALES AND ENGINEERING OFFICES IN PRINCIPAL CITIES

E-M Control for four 1000 kva, 2400 volt generators. Precise, fool-proof paralleling of the generators is provided by the E-M Automatic Synchronizers

Specialists in
Synchronous Generators and Controls
since 1903

E-M Enclosed, Low-Voltage Generator Panel with air-circuit breaker type switch for non-parallelized generator. One of 125 similar units for use with 62.5 kva, 400/230 volt a-c generators.



• E-M Automatic Synchronizer. Puts generators on the line automatically. Makes paralleling easy and simple.

• E-M Synchrostat* insures high-quality voltage regulation... Available for generators up to 187.0 kva.



The Best
FOR YOUR GENERATORS

**E-M
CONTROL**



*Reg. U. S. Pat. Off.

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manager of The Cooper-Bessemer Corporation. "In connection with the development of these new markets," Mr. Vaupel said, "there will be a need for hundreds of returned veterans to join the ranks of this growing industry."

"Of course, hundreds of veterans who left Diesel plants to answer their country's call, will return to their old jobs. Every industry is making plans to take care of that situation, but the Diesel industry must go further than that. It must take into consideration the huge demands that will be made for its products for new and

expanded uses and develop training programs that will enable new workers to qualify for Diesel jobs.

"The postwar period will see widespread development in rural electrification, in the manufacture of Diesel-powered buses, trucks, locomotives, farm machinery, in industry and ships of various sizes and purpose. To meet these demands, the Diesel industry must continue to expand and in that expansion must make room for hundreds of new men, as many of them as possible returned war veterans of qualification."

Whether you call them petroleum residues or just everyday sludge and gum, they reduce power and shorten engine life. Now that motors are irreplaceable, more and more thousands of owners are protecting theirs with **LOOSITE** and **SILOO**.

The **LOOSITE-SILOO** treatment is speedy, safe, sure and economical. It has been tested and proven through fifteen years of service on diesel engines of all types and sizes, for all purposes.

Since every lost hour of service slows production and every extra hour speeds it up, it is vital that your motors be saved from their two worst enemies, sludge and gum. Write for full information.

If you heat with oil—write for information on
SILOO FUEL OIL TANK SOLVENT.

PETROLEUM SOLVENTS CORP. • 331 Madison Avenue, New York 17, N. Y.

W. V. Walkinshaw Appointed

THE appointment of W. V. Walkinshaw as manager of industrial sales, succeeding the late Roland G. Justus, was announced by the Westinghouse Air Brake Company.



W. V. Walkinshaw

Mr. Walkinshaw has been connected with the Westinghouse Air Brake Company since July 1, 1939, having been first engaged as a mechanical expert at St. Louis, a position he held until May 1, 1941. He then was promoted to representative in the southwestern district, specializing in industrial sales. Prior to joining the company he had been employed by several sales and service organizations in the automotive trade.

Marine Diesels Described in Booklet

A SERIES of marine Diesel engines, six and eight cylinders, with a power range of 350 to 675 horsepower, is described and illustrated in a new 16-page booklet issued by the Joshua Hendy Iron Works. Included are exterior and cutaway views, illustrations of 22 major features, general-dimensions chart, general specifications, power-rating curves, and pictures of manufacturing methods. Applicants should ask for Publication JHA-11. Address requests to Joshua Hendy Iron Works, Sunnyvale, California.



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WITH

Brad Foote Gears

RATIOS

HERRINGBONE	2:1 to 295:1
WORM	3 ⁵ / ₈ :1 to 60:1
GYRO	16:1 to 30,000:1
SPUR	2:1 to 40:1
VERTICAL HELICAL	2:1 to 80:1
SPIRAL BEVEL	1:1 to 5:1
PLANETARY	4:1 to 400:1
OIL WELL UNITS	12:1
LITTLE GIANT	28:1

Brad Foote precision cut gears are made in our ultra modern plant from any practical material in all practical sizes, (spur gears may be cut in diameters up to 108 inches) in any quantity, large or small.

Trained personnel—extensive shop equipment necessary to do all types of special precision gears—large plant capacity assure the prospective buyer maximum results and production in amounts of any proportion.



ARMY E NAVY
BRAD FOOTE GEAR WORKS

1309 South Cicero Avenue
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**Bulletin Describes New
All-Directional All-Purpose
Vibration Control Unit**

THE newly developed Korfund Type SL Universal Vibro-Isolator is described in detail in a four-page bulletin recently published by The Korfund Company, Inc. The bulletin points out that the ability of the unit to absorb vibration in all directions makes it an effective vibration control for a wide variety of applications, including: Punch presses, shears, hammers, grinders, shakers, Diesel engines, generators,

panel boards, material testing equipment, recording apparatus, business machines and ventilating and air conditioning equipment. It is said to be particularly effective in cushioning impacts from all horizontal directions where unbalanced forces, centrifugal action or external belt pulls are encountered.

The bulletin contains complete data regarding the rated loads, weights and dimensions in the six basic sizes in which the Type SL Vibro-Isolator is made. According to these data the

load capacity of the different sizes ranges from 200 to 12,000 lbs. Copies of this bulletin may be obtained by writing to The Korfund Company, Inc., 48-15 Thirty Second Place, Long Island City 1, N. Y.

**Victor Gasket Co.
Issues New Catalog**

THE Victor Manufacturing & Gasket Company has just issued the 14th edition of the Victor Gasket Guide. This widely used gasket reference catalog contains comprehensive data on all kinds of gaskets required for replacement in automobiles, trucks, tractors, buses and industrial and marine engines.

**WITTEK
HOSE
CLAMPS**

TYPE RW

TYPE FBC

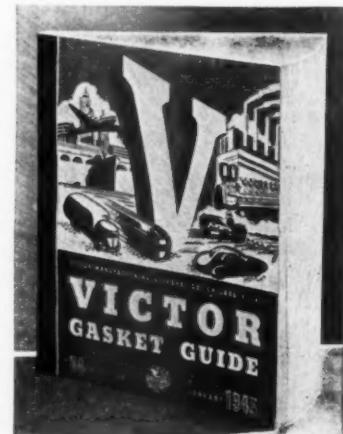
TYPE RN

TYPE RM

FOR DIESEL APPLICATIONS
Strong—Dependable—Easily Installed

The dependability of Wittek Hose Clamps, long accepted by the automotive and aviation industries, is now being proven by actual service with the armed forces of the United Nations as standard equipment for aircraft, tanks, jeeps, trucks, ships and other combat vehicles. Wittek Hose Clamps are made in many different sizes and types for Diesel applications: Type RW for hose connections of 5" in diameter and larger; Type RM for 3½" to 5"; Type RN for 2½" to 3½" and Type FBC for 2½" hose connections and smaller. Write for new descriptive catalog. Wittek Manufacturing Co., 4305-15 West 24th Place, Chicago 23, Illinois.

WITTEK HOSE CLAMPS
Dependable Hose Connections



Among the convenient new features are full numerical listings of factory part numbers with Victor numbers, special indexing when there are numerous motor models, markings of alphabetical listings to show the contents of gasket sets, and an up-to-the-minute popularity rating of gaskets and oil seals. For a copy of this guide write Victor Mfg. & Gasket Co., 5750 Roosevelt Road, Chicago 90, Illinois.

**THE
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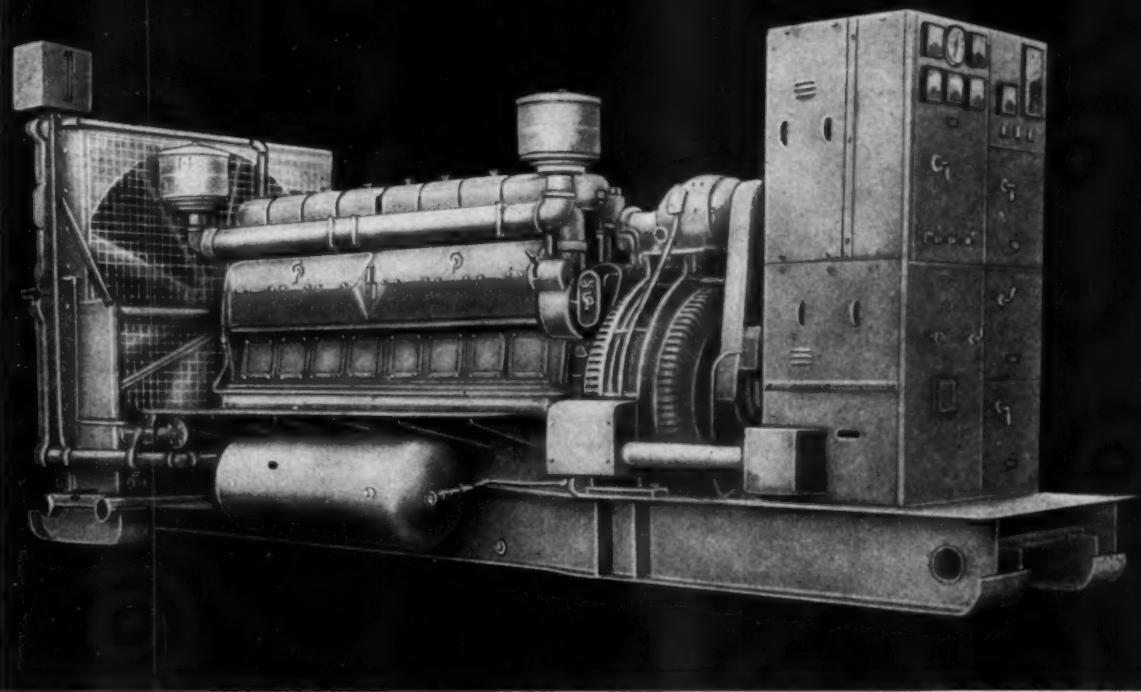
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ROGRESS

Semi-Portable Ready for Instant Use



CP Diesel Electric Power Unit

READILY portable, CP Diesel Electric Power Units are furnished complete with all accessories — intake filter, exhaust silencer, starting air equipment, oil and water cooling equipment, switchboard, voltage regulator and wiring. Upon arrival at location and with minimum support these fully assembled CP Power Units are ready for immediate use.

Built in 100, 175 and 260 kw sizes, for

any voltage and current characteristics, CP Diesel Electric Power Units are designed so that, where larger amounts of power are required, two or more CP units can be readily paralleled in multiple unit application. They are ideal for application in the petroleum, utility, contracting, mining and other fields where quick installations are essential. Write today for data on CP Diesel Electric Power Unit.



CHICAGO PNEUMATIC
TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.



Dresser Industries Opens Cleveland Offices

NEW centralized administrative offices of Dresser Industries, Inc., formerly of Bradford, Pa., were opened March 19th at 1130 Terminal Tower, Cleveland, according to H. N. Mallon, president. Planned to provide the latest and most efficient business facilities for the company's personnel, the new offices also reduce executive travel time to the company's 18 different plants by providing a more central location for the company's headquarters.

Dresser Industries member companies include Bryant Heater Company, Cleveland; Dresser Manufacturing Division, Bradford, Pa.; Clark Bros. Co., Inc., Olean, N. Y.; Pacific Pumps, Inc., Huntington Park, California; International Derrick & Equipment Co., Columbus, Marietta, and Delaware, Ohio; Beaumont, Texas, and Torrance, Calif.; Stacey Bros. Gas Construction Co., Cincinnati; Roots-Connerville Blower Corp., Connerville, Indiana; Dresser Mfg. Co., Ltd., Toronto; Bovaird & Seyfang Mfg. Co., Bradford, Pa.; and Van der

Horst Corp. of America, Olean, N. Y. and Cleveland.

Ohio's First Vet Training Program Gives 17 Postwar Job Education

OHIO'S first industrial rehabilitation program for returned war veterans, inaugurated at the Mount Vernon, O. plant of The Cooper Bessemer Corp. last June, is now settling the postwar job future for 17 former members of the armed forces, from three branches of the service and the Navy C.B.'s.

INTRICATE
-- yet uniformly accurate

Regardless of the number of intricate operations required to complete the Screw Machine Products you need—you will find The Chicago Screw Company a dependable source of supply.

In the production of any specified part, accuracy is held to extremely close tolerances. This accuracy applies to any and every operation, whether it be thread grinding, internal and surface grinding, precision thread rolling, broaching, or any of the many secondary operations we perform in the production of hardened and ground parts.

Investigate, and you will find that our extensive facilities and experience, acquired over 73 years of manufacturing precision screw machine and cold upset products can be of great value and assistance to you.

THE CHICAGO SCREW CO.
1026 S. Homan Ave. Chicago 24, Ill.



Return Vets study machinist trade at Cooper Bessemer.

The initial trainee class of nine veterans who began studying to become journeymen machinists when the program was started, has now grown to 17 members, according to B. B. Williams, chairman of the board of The Cooper Bessemer Corp., and additional veterans will be absorbed as soon as they are available and can qualify.

A Merchant Seaman Pleads For Books

GO to your library, be it large or small, look through those books you have known so long and loved so well. Think of the pleasure you had when you first read them, the reviews that aroused your curiosity; the people who talked about them to you; and then the evening when you lit a cigarette, turned the radio off, and opened the book at the first page.

There are men in the Merchant Navy who have never read those books, and unless you choose to help, they never will. Good libraries do not abound in sailor town, or on the long jetties where the tankers load.

The books that are aboard ships are cherished as a sign of good friendship, and returned at once. Dog-eared they may be; the covers worn shabby—but they stack up as the sailors' only relaxation, against the landsmen's movies and theatres and radio shows.

Take those books you have loved, and share them with us. The classics you have read and

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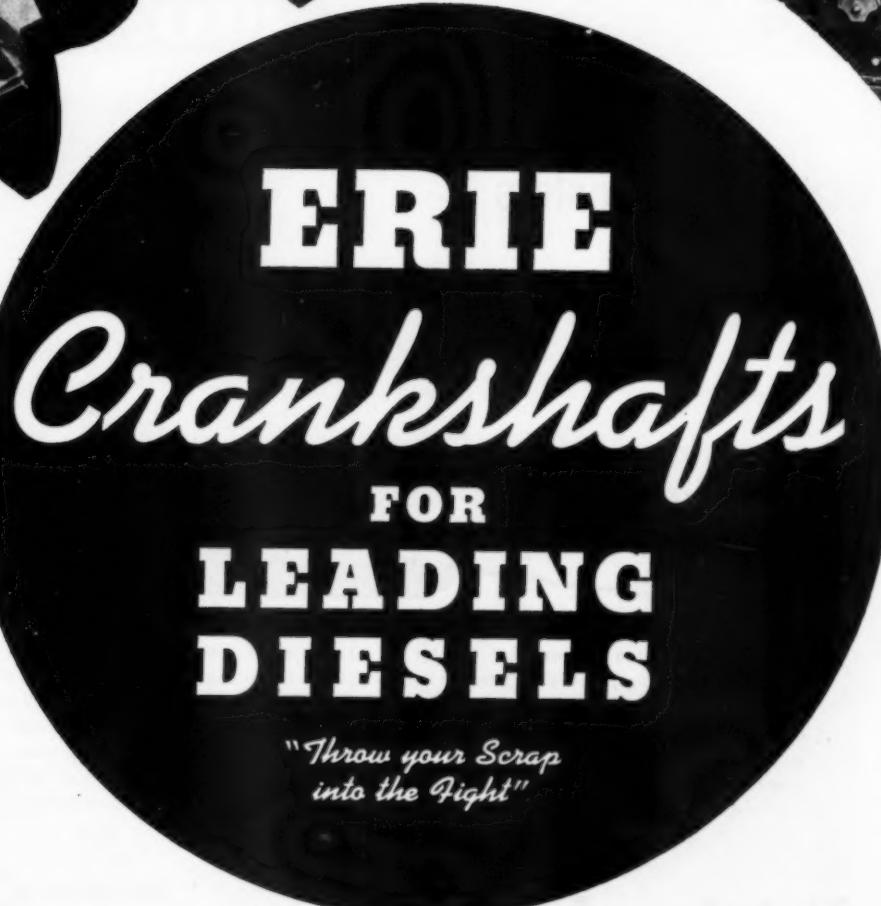
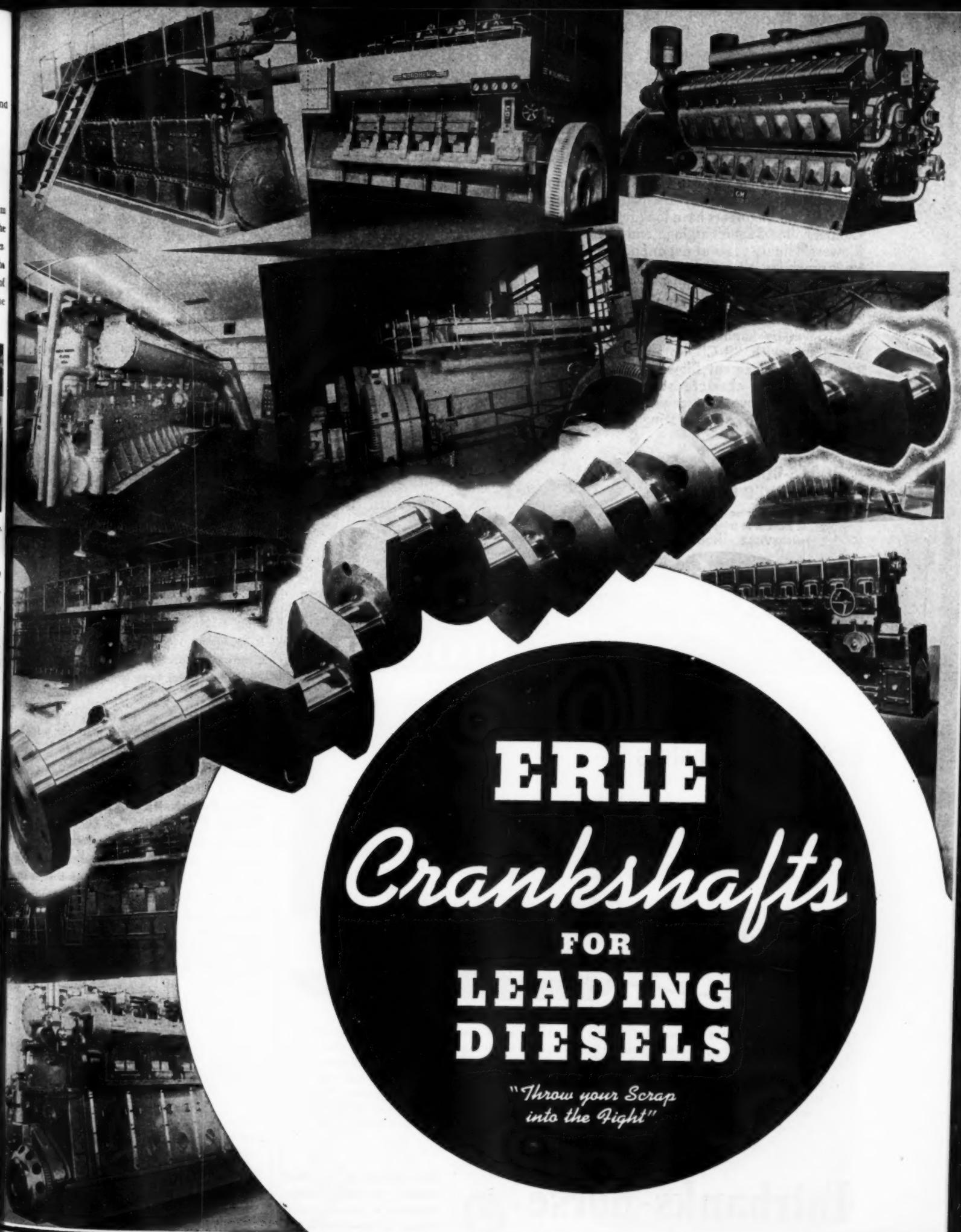
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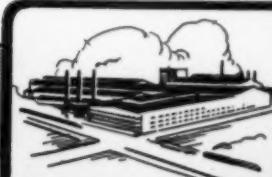
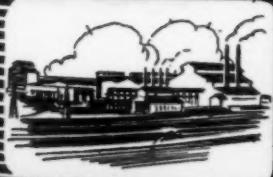
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PROGRESS



ERIE FORGE COMPANY, ERIE, PA.



90 YEARS EXPERIENCE

Where high efficiency, dependability, economical operation, and long life are major considerations, Diesel Engineers have long favored Roots-Connersville Supercharging and Scavenging Blowers. Ninety years of experience in successfully providing air supply for all manner of applications, operating conditions, and performance requirements is assurance that your supercharging and scavenging problems will be handled to best advantage with "R-C" Rotary Positive Displacement Blowers. They have the characteristics needed to achieve best engine performance at all operating speeds.

ROOTS-CONNERSVILLE BLOWER CORP.

One of the Dresser Industries
505 MIDLAND AVENUE
CONNERSVILLE, INDIANA

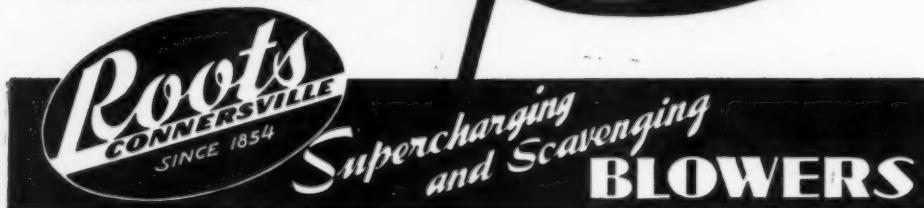


Photo shows "R-C" Scavenging Blowers installed on two Diesels at the South Norwalk, Conn., Municipal Power plant. Capacity of each blower exceeds 13,000 CFM, 800 RPM, 2½ lbs. pressure

Evaporative Coolers

by
Fairbanks-Morse

for

**ECONOMY
EFFICIENCY
EFFECTIVENESS**

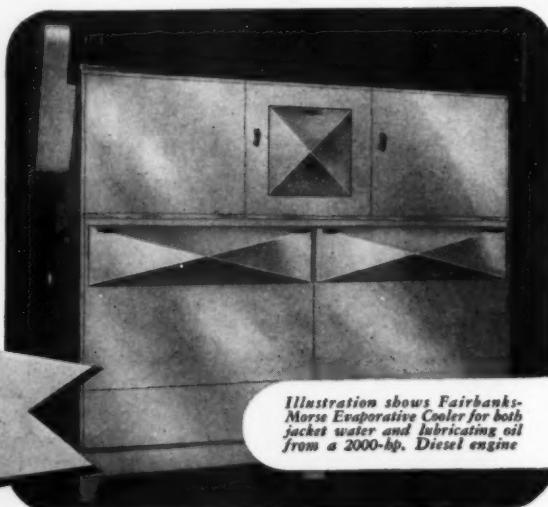


Illustration shows Fairbanks-Morse Evaporative Cooler for both jacket water and lubricating oil from a 2000-hp. Diesel engine

A Fairbanks-Morse Evaporative Cooler, in a closed system, cools engine jacket water most economically, efficiently, and effectively. It eliminates freeze-ups. By circulating clean, soft water, it keeps passages free from scale and dirt. It economizes on fuel—keeps water and lubricating oil

always at the same temperature. It saves space, simplifies piping systems. And, where it replaces a heat exchanger using raw water, effects a saving in water and pumping costs of about 95 per cent. For information write Fairbanks, Morse & Co., Fairbanks-Morse Bldg., Chicago 5, Ill.

BUY MORE WAR BONDS

Fairbanks-Morse
A name worth remembering



Diesel Locomotives • Diesel
Engines • Generators • Motors
Magnets • Scales • Pumps
Stokers • Railway Motor Cars
and Standpipes • Farm Equipment

re-read; the textbooks that taught you more of your job; and the murder mysteries that kept you enthralled. They will be put on our ships, and we will be grateful to you. Books may be sent to the Conrad Library, Seamen's Church Institute of New York, 25 South Street, New York 4, N. Y. They are distributed to seamen of the United Nations' ships.

Elliott Company Announces Executive Changes

CREATION of the office of engineering vice-president and additional responsibilities for other executive officers of Elliott Company, Jeannette, Pa., were announced by Grant B. Shipley, board chairman and president, following the company's annual meeting.

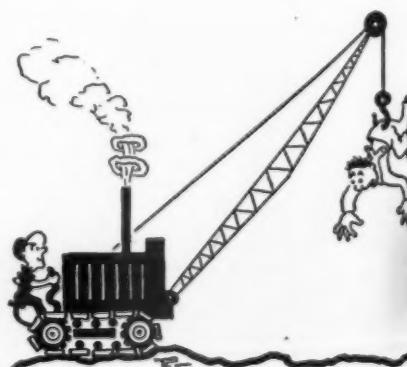
W. A. Elliott, vice-president in charge of sales, was elected executive vice-president. Ronald B. Smith, manager of engineering research and development, was elected vice-president in charge of engineering. M. G. Shevchik, secretary, was elected secretary and treasurer.

Elliott executive officers re-elected include: Grant B. Shipley, board chairman and president; F. H. Stohr, assistant to the president; R. W. Owens, vice-president in charge of manufacturing, and Dundas Peacock, controller. Present directors were re-elected by the shareholders.

F. W. Dohring, general sales manager, was given added responsibilities as assistant to the executive vice-president.

Ohio Crankshaft Appoints Texas Distributor

APPOINTMENT of the Perry Machinery Company of Dallas, Texas, as a special distributor of Tocco Process induction heat treatment equipment is announced by William C. Dunn, president of The Ohio Crankshaft Company. The Perry Machinery Company which becomes the tenth distributor of Tocco equipment, will serve the growing southern industrial area.



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REINER
GENERATING SETS
and
AUXILIARY UNITS
Reiner Marine
Auxiliary Unit

Made to Order

You need auxiliary power . . . auxiliary air . . . auxiliary pumping capacity. With a Reiner Auxiliary Unit you don't have to fit your requirements into the "nearest" unit. Rather the above equipment is selected to fit your requirements and then assembled into a compact unit.

That's what makes Reiner Auxiliary Units the better buy . . . what has influenced such exacting buyers as the Army, Navy, Coast Guard and Maritime Commission to accept Reiner.

JOHN
REINER & COMPANY
12-12 37th Avenue
Long Island City 1, N. Y.

5-RC-1

Aireon Appoints Ralph R. Gunderson

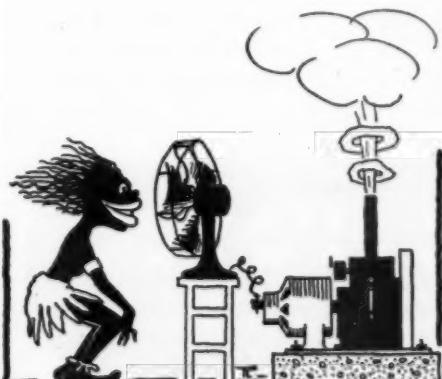
JOHN B. WALKER, vice president in charge of sales, announces the appointment of Ralph R. Gunderson as sales manager of the Brake Division, Aireon Manufacturing Corporation (formerly Aircraft Accessories Corporation), with headquarters in Chicago.



Ralph R. Gunderson

Ralph Gunderson is widely known as an authority on automotive brakes and is author of the Brakeman's Handbook which is regarded as the "bible" of the industry among engineers, designers, service men and operators. His familiarity with all aspects of brake problems is due, in no small measure, to his coverage of the United States and Canada for nearly 20 years. He has conducted schools for mechanics in the field for training them in the science of brake installation, maintenance and service.

"The appointment of Ralph Gunderson," states Mr. Walker, "is in line with the policy of Aireon Manufacturing Corporation to place recognized authorities in key executive positions to render the utmost in intelligent, time-proven service to the corporation's customers in each specific field."



SPECIFY **HILCO**

FOR LUBRICATING, FUEL AND INDUSTRIAL OIL PURIFYING

A complete line of lube oil purifiers using Fullers Earth - cotton waste and specially prepared filtering agents.

HILCO OIL RECLAIMERS

A simple, economical and foolproof method of restoring contaminated oil to the full value of new oil, — for direct connecting to one or more Diesel engines for continuous or intermittent operation.

HILCO HYFLOW OIL FILTERS..

A superior oil filter for perfect filtering of Diesel engine lube oil — for direct-connecting to one or more engines — continuous or intermittent operation.

HILCO AIRLINE OIL PURIFIERS

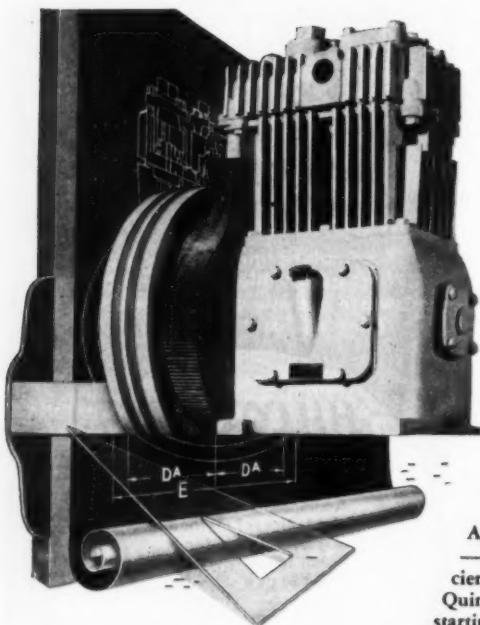
A perfect method for contact oil purifying for complete oil reconditioning. For batch purifying directly from engine lube oil system or transfer tanks.

The Hilco line offers you a complete lubricating oil purifier service. Write today for free literature and see what Hilco operators are doing—then let us help you select a Hilco to take care of "That Particular Job."

OIL PURIFIER HEADQUARTERS

THE
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122 W. 4th ST., ELMIRA, N.Y.



*Designed
FOR
Tomorrow*

... HERE TODAY

Advanced design — both inside and out — accounts for the greater over-all efficiency, compactness and eye-appeal of Quincy Compressors. Put them to work starting Diesels . . . operating brakes . . . actuating pneumatic controls . . . and on other services requiring intermittent pressures up to 500 lbs. per sq. in. Quincy makes air compressors exclusively . . . call in a Quincy specialist. Write Dept. K-21.

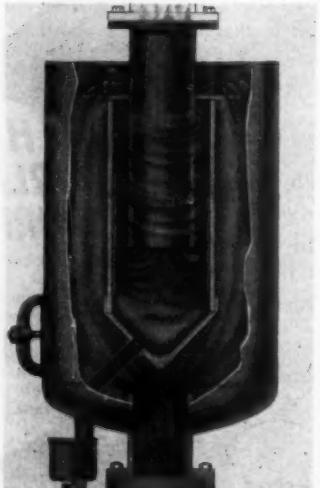
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QUINCY COMPRESSOR CO., QUINCY, ILLINOIS
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SIMS-WHITTINGTON CYCLONE *Silencer and Spark Arrestor*

We offer no complicated graphs or tables in the selection of an S-W Silencer. Internal Combustion Engine builders have determined the proper size exhaust pipe in designing their engines. We start there. The Sims S-W Cyclone Silencer is built only in one style and 15 sizes from 1" through 18".

The exhaust gases make 3 reversals through progressively smaller passages and pass lazily into the atmosphere. Sound is throttled and solids



Write for Booklet

SIMS HEAT RECOVERY EQUIPMENT

HEAT EXCHANGERS • EXHAUST GAS BOILERS • ENGINE SILENCERS • STORAGE WATER HEATERS • OIL HEATERS • OIL COOLERS • FEED WATER HEATERS AND UNIT TYPE PULVERIZERS

John C. Cotner Heads New Division of Gerotor May

THE Gerotor May Corporation, one of the country's large manufacturers of hydraulic pumps, has acquired the Cotner Machine Products Company of Logansport, Indiana. John C. Cotner, a founder of the Logansport firm, has become a Gerotor May vice-president, member of its board, and general manager of its new Logansport division.



John C. Cotner

The products of the new plant will remain air and hydraulic equipment, used on machine tools, important war equipment and in industrial plants. Immediate increase in the Logansport factory facilities will follow the erection of a new building construction of which is under way. Other expansion plans call for the erection of additional wings.

Distributor of Automotive and Tractor Supplies

THE R. W. Schnack Co. of Los Angeles, an established distributor of automotive, aircraft and tractor equipment and supplies announces its intention to add several lines of products which apply to these fields and is interested hearing from manufacturers seeking exclusive representation within a prescribed territory. The company's present lines are sold through automotive jobbers. Interested manufacturers may open negotiations by writing the R. W. Schnack Co., 1445 Glenville Drive, Los Angeles 35, California.

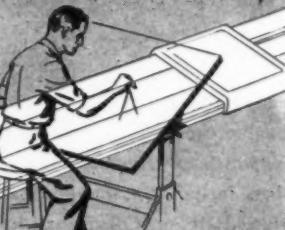
Cleveland Diesel Division Issues Diesel-Electric Ship Booklet

NINETY-NINE Diesel-electric drive vessels ranging from 98 ft. commercial tugs to 529½ ft. Submarine Tenders are illustrated in a new booklet just issued by the Cleveland Diesel Engine Division of General Motors. There are Destroyer Escort Vessels, many Submarines,

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hydraulic
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John C.
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of its new

WGB CLAROFIERS

ENGINEERED TO THE JOB



TO ELIMINATE
PREMATURE
ENGINE WEAR

WGB Clarifiers are not cheap—but built to cost less in the end. Records prove that WGB oil clarification is less expensive in the long run. That's because WGB is rugged, simple, and specially engineered for the heavy-duty job it's called upon to do. Sturdy WGB Clarifiers outlast your gas or Diesel engine, and their low-cost refill cartridges, easily installed without tools, cost less than an oil change. They keep oil amber-clear, prevent sludge and acid. Excessive wear on hard-to-get parts is eliminated . . . maintenance and oil changes are reduced to the minimum. Specify WGB Clarifiers for greater satisfaction and economy.

The free WGB book explains oil-clarifying, illustrates various WGB models for gas and Diesel engines. Send for it.



WGB
OIL CLARIFIER, INC.
KINGSTON, N.Y.

LET'S KEEP SEDIMENT
OUT OF LUBRICATION

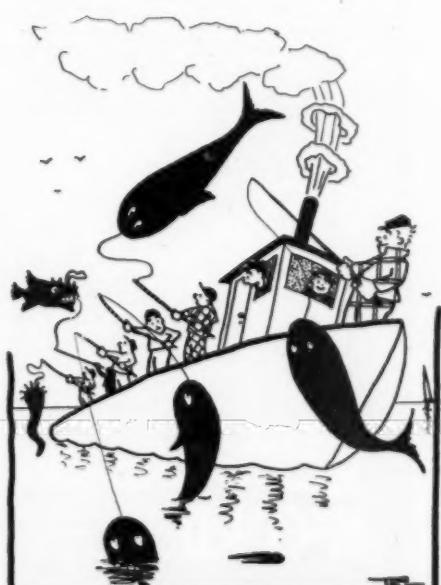
Minesweepers and Mine Planters, Net Tenders, Army, Navy and Commercial Tugs—both seagoing and harbor types, the famous U. S. Engineer Hopper Dredges, *Haines and Hoffman*, New York's 2000 hp. *Firefighter*, Tankers, the Electric Ferries and many others—an array of vital services sufficient to dispel any doubt as to the soundness of Diesel-electric ship propulsion. To look through this Cleveland Diesel booklet is to more readily accept the fact, freely stated by the Navy, that the total installed Diesel horsepower in the Navy exceeded that of steam better than a year ago.

Gray Distributor Opens New Washington Office

THE Gray Marine Motor Company announces an expansion of sales, service parts and consulting service facilities to serve the Washington and Baltimore areas, a new branch office of Mahon & Gall, distributor for Graymarine gasoline and Diesel engines, located at 840-17th Street N.W., Washington, D. C.

This move makes available to boat operators in the Washington section the same helpful marine engine service as Mahon & Gall has been giving Maryland boat operators for the past forty years. The Baltimore headquarters of Mahon & Gall is at 104 E. Pratt Street.

John Mahon and Alfred Gall, well known to the industry, have been joined by Fred Crebbin III. Mr. Crebbin had previous experience in the Gray factory organization prior to the war as sales engineer, and returns to the Gray organization after a period of two years in which he was "loaned" to the U. S. Navy as a marine engine technician.



USE HEADED AND THREADED FASTENERS
FOR ECONOMY AND RELIABILITY

BRASS BOLTS • NUTS STUDS

Brass and bronze, all types—every non-ferrous metal—available in all standard dimensions or to your specifications.



Better Bolts
of Iron,
Steel, Brass
and Other
Metals Since
1882

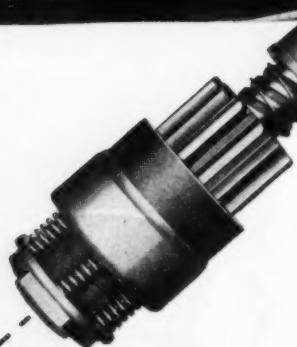
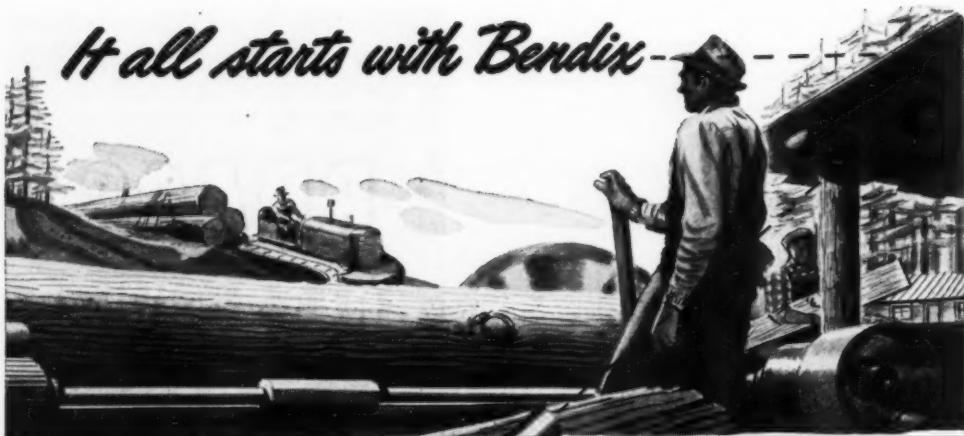
"THE BOLT MAN"

PAUTUCKET

MANUFACTURING COMPANY,
327 Pine Street • Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

It all starts with Bendix



**The Drive for
Heavy-Duty Starting**

In the forests . . . on the farms . . . in the oil fields . . . wherever heavy-duty industrial machinery requires starting under severe conditions, Bendix Starter Drives have a remarkable record of dependability. These Heavy-Duty Drives are specifically designed and engineered to meet the most rugged conditions of work and weather. If you have a heavy-duty starting problem, better buy Bendix—over sixty-five million Bendix Drives of all types have been installed—proof positive of their value!

BENDIX AND ECLIPSE ARE TRADE-MARKS OF BENDIX AVIATION CORPORATION

Bendix Drive

ECLIPSE MACHINE DIVISION
BENDIX AVIATION CORPORATION
ELMIRA, NEW YORK

OAKITE
SHORT CUTS
FOR Diesel OPERATORS

Preventing Slime on Evaporative Coolers

Are you employing evaporating coolers to control the temperature of Diesel engines? Then you know that unless the recirculating spray water is properly treated, slime and other deposits build up on condenser coil surfaces. When this happens, cooling capacity is reduced.

To meet this problem, introduce recommended solution of Oakite Airefiner into the spray water . . . it helps prevent slime formation effectively. FREE details gladly sent on request.

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Technical Service Representatives Located in All
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Specialized CLEANING

AUTOMATIC & MANUAL METHODS FOR EVERY CLEANING REQUIREMENT

McCord
Class S.F.
LUBRICATORS

A modern lubricator for modern service
on Diesel, gas, steam engines and com-
pressors. Supplies dependable cylinder
lubrication in metered quantities reducing
friction and wear. Capacities: 2 to 24 pt.
and 1 to 16 feeds. New catalog on request.



McCord RADIATOR & MFG. CO., DETROIT, MICHIGAN
LUBRICATOR DIVISION

RESULT OF 40 YEARS' LUBRICATOR BUILDING EXPERIENCE

Walter Kidde & Company Receives Army-Navy "E"

WALTER Kidde & Company, Inc. was awarded the Army-Navy "E" award on Saturday April 7, at its main plant in Belleville, N.J. The company manufactures carbon dioxide fire extinguishing equipment for all types of airplanes, marine vessels and military vehicles, as well as inflation units for life-rafts, lifebelts and "Mae Wests," pneumatic gun chargers, cases for aerial rockets, cylinders and valves for compressed gases, emergency power actuators for aircraft, and industrial fire-fighting systems. The company sponsors the "Sea Squatters' Club," an informal organization of airmen forced down at sea, which now numbers many hundreds of members including Capt. Eddie Rickenbacker, Lt. Harold Dixon, Col. Hans Christian Andersen, and other famous "squatters."

Gerotor May Corp. Appoints Eastern Distributor

GEROTOR May Corporation, Logansport, Ind., announces the appointment of Compressed Air Products, Newark, N.J. as exclusive sales representative of Gerotor air and hydraulic devices for New Jersey and Greater New York. Headed by Addison T. Smith and Walter H. Ellis, the organization of Compressed Air Products has had long experience in the air and hydraulic field. The line of Gerotor air and hydraulic products handled by Compressed Air Products includes valves, cylinders, pump fluid motors, pump units, work-holding devices and vices.

Elliott Company Announces Two New Appointments

H. S. PAHREN is appointed plant manager of the Ridgway Division, Elliott Company, according to announcement by Grant B. Shipley, president.

Pahren, who joined Elliott Company in 1928 after attending the University of Cincinnati, was connected with the Kansas City, Omaha, Tulsa and St. Louis offices of the company before becoming sales manager of the Ridgway Division in 1941.

F. E. Millan's appointment as sales manager of the organization's Ridgway Division is announced by F. W. Dohring, general sales manager. A graduate of Cornell University with a degree in electrical engineering, Millan took Elliott Company's apprentice course in 1935 and was assigned to the Detroit office as field engineer. In 1942 he was assigned to market research on the company's electrical equipment and became director of exports in 1944.



Maxim Silencer Awarded Army-Navy E" Star

THE Maxim Silencer Company of Hartford, Connecticut, was recently awarded a third star on their Army-Navy "E" Production Award. Award was made by Lieutenant Frederic A. J. as exclusive Logansport resident of Commingham, USNR.

receiving the original award in the middle of 1943, the Maxim Silencer Company added their second star six months later and their third star June, 1944. Maxim Silencers are in wide use today on Diesel powered craft in the Navy, Coast Guard and Merchant Marine, as well as Diesel equipped industrial plants throughout the country.

Commenting on the award, H. H. Maxim, president of the company, said "I am proud to see the third star on our Army-Navy pennant. This is an indication of the singleness of purpose with which the people in our plant have stuck to their jobs of producing equipment that our fighting forces need. Knowing them as I do, I am sure that they will keep it up."

Changes at Enterprise

At the annual meeting of the Enterprise Engine & Foundry Company in San Francisco, the following men were elected to the Board of Directors: G. J. Panario, W. L. Andrews, A. O. Stewart, W. E. Butts, C. P. Hoehn, C. S. Herrett, and C. H. Schimpff.

At the organization meeting of the Board, the following officers were elected: G. J. Panario, Chairman; C. P. Hoehn, President; C. S. Herrett, Executive Vice President and Sec.-Treasurer; H. C. McKenna, Controller and Assistant Secretary; R. E. Kroeck, Assistant Secretary.

All directors were re-elected with the exception of C. G. Cox, former Vice President, whom we understand has resigned both as Vice President and Sales Manager.

HALL WET TYPE DIESEL VALVE REFACER

Model 80-A

Special type COLLET holds valve stem securely without brinelling or marking stem.

WET GRINDING prevents surface burning and stem growth; produces finer finish.

Handles valves to 5" head dia.

QUICK-ACTING CHUCK LOCK for quick, easy insertion or removal of valve.

FULL BALL BEARING SPINDLE insures smoother operation.

GRINDING WHEEL MOTOR

MICROMETER WORKHEAD FEED CONTROL Operator knows exact amount of metal being removed.

DUPLOCATES ORIGINAL FACTORY PRECISION AND FINISH

MASTER MOTOR SWITCH and CUTOUT SWITCH

RHEOSTAT CONTROL adapts Workhead speed to valve dia.

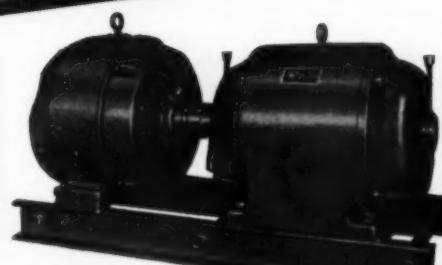
TRANSVERSE or CROSS-FEED LEVER.

DOVETAIL TYPE WAYS accurately machined. Spring-loaded bronze gibs compensate for wear.

Write the factory or consult your HALL Jobber for complete information on the 80-A Refacer.

THE HALL MANUFACTURING COMPANY • TOLEDO 7, OHIO

**AC★DC and DC★AC
4 Bearing MOTOR GENERATOR SET**



Designed for maximum output with ample overload, motor and generator are joined with a high grade flexible coupling, both mounted on a fabricated steel base.

Kurz and Root AC-DC motor generator sets meet every requirement where AC power supply is available but DC power is required—for battery charging, electroplating, welding, etc. DC-AC motor generator sets meet requirements where DC power supply is available but AC power is required—shipboard, industrial plants, etc.

I KW TO 30 KW OUTPUT

KURZ and ROOT Company
APPLETON - WISCONSIN Since 1898
...and 36 motors and motor generator sets

Engineering data upon request.

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Recognition of outstanding production of w

Army-Navy "E"
TO New Sperry Division



TOOLING FOR SPEED AND ACCURACY

Hecker offers you a complete engineering and tool making service from the original design to the finished tool—free from split responsibility. Write for our brochure "Men and Machines."

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ENGINEERS and Tool Makers

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THE
FLEXIBLE - SEAMLESS - ALL-METAL HOSE



FOR STEAM - WATER - OIL - CHEMICALS
GAS - AIR - ETC. Literature on Request

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MANZEL
FORCE FEED
LUBRICATORS
for Most Efficient Diesel Lubrication



Nearly 50 years experience in building force feed lubricators exclusively is back of every Manzel Lubricator. Manzels are positive, dependable, accurate. They never forget. They deliver exactly the right amount of oil on each pump stroke. Insist on Manzel Lubricators on your Diesel engine.

Write for catalog 94-9
MANZEL BROTHERS CO.
75-77 BARCOON STREET
BUFFALO, N.Y.

Enterprise Board Elects
C. S. Herbert



C. S. Herbert

DIRECTORS of the Enterprise Engine Foundry Company of San Francisco at their annual meeting elected C. S. Herbert executive vice president. In this capacity, Mr. Herbert is vested with executive direction of the engine, process machinery and combustion equipment divisions of the firm. Mr. Herbert, who joined Enterprise a few years before the war, is also secretary-treasurer. In 1942 he was elected to the company's directorate and a year later to vice presidency. A specialist in industrial management, he was formerly manager of the special services division on the Pacific Coast for Ernst & Ernst, and has had vast experience in organizational problems.

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Kilberry Resigns

EFFECTIVE May 15, 1945, F. Howard Kilberry resigns as President and Director of Atlas Imperial Diesel Engine Company, with factories in Oakland, California and Mattoon, Illinois. At press time no information had been obtainable from Oakland regarding the new president for Atlas. Neither has Mr. Kilberry yet announced his future plans.

Frank P. Herman Appointed Executive Vice-President Purolator Products

FRANK P. HERMAN has been named Executive Vice-President of Purolator Products, Inc., according to an announcement by Ralph R. Compte, President of the company.



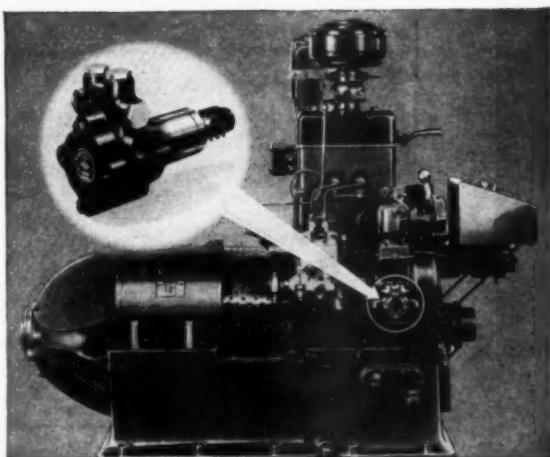
Frank P. Herman

Mr. Herman has been associated with Purolator Products, Inc., the founder-leader of the oil filter industry, for over 18 years. He served for a considerable period as Manager in charge of Equipment Sales of Purolator's Detroit office. He was later made Vice-President in charge of Equipment Sales at the Newark headquarters of the company and continued in that capacity until his present promotion to Executive Vice-President. Martin Stoltz, formerly Assistant Manager of Equipment Sales for Purolator Products, Inc., has been promoted to the post of Manager of Equipment Sales.

New Terminal Block Booklet

A NEW booklet is available describing 10 styles of Controlead Terminal Blocks originally developed for central station and sub station control cable connections and now widely used as junction point in any control wiring installation complete with styles, cross section views, dimensions and prices. Address Dept. T. B. Burke Electric Company, Erie, Pa., for a copy of this booklet.

"SPECIFY EDCO ROTARY PUMPS"



EDCO

ENGINE DRIVEN
FUEL TRANSFER
PUMPS.

Noiseless in operation • Economical to operate and maintain • Pumping action equally effective at all operating speeds, be-

cause of unique and positive method of positioning rotor vanes to maintain effective seal. Capacities up to 15 gal. per min.

Engineering services and descriptive literature on request.

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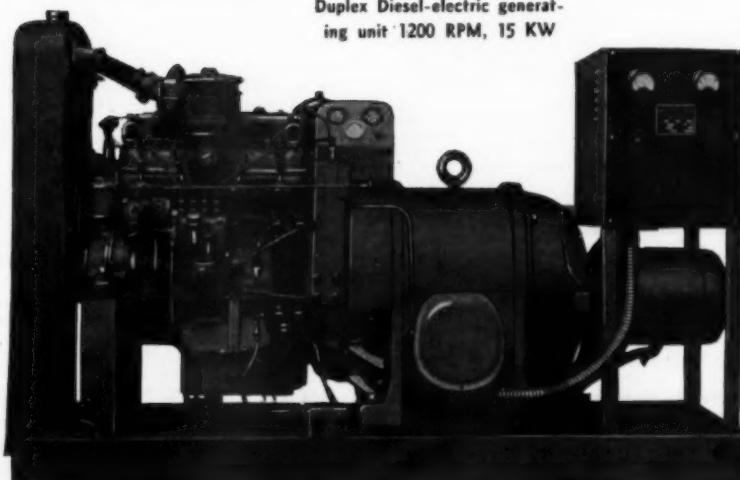
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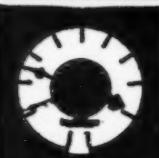
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WEST COAST DIESEL NEWS

By JIM MEDFORD

DEMAND for new Diesel-engined tuna clippers continues with Hodgson-Greene-Haldeman, Long Beach, California, framing a 100-ft. vessel to be powered with an Enterprise 400 hp. and three Caterpillar generating sets; GE motors, F-M pumps and a Lambie wheel.

REPOWERING the *Amelie*, P. E. Harris & Co., Seattle, Washington, are installing a 320 hp. Atlas Imperial marine Diesel in the tender that will serve their Alaska canneries.

THE W. F. Stone & Co., Alameda, California, yard in charge of Lester Stone, has completed the 250 hp. Enterprise-engined *Nancy T*, purse seiner; Exide batteries, F-M pumps; speed ten knots.

ANOTHER Enterprise Diesel-engined clipper is contracted for at Lynch shipyards, San Diego, California, by M. O. Medina—115 ft. with 600 hp. main engine and a pair of Lorimer Diesel 120 hp. auxiliaries; GE generators, F-M pumps.

FROM Puntaranas, Costa Rica, the *Valerie* is getting two new 80 hp. General Motors auxiliary Diesels with GE generators. Main engines are two 250 hp. Winton Diesels.

COMPLETING their 100th hull, Nunes Bros., Sausalito, California, are installing a 135 hp. Murphy Diesel in the 60-ft. trawler. Reduction gears are Joes 3:1; owners Frank Aliota Fish Co.

TO be named *Renown*, an 86-ft. seiner is under construction by S. E. Sagstad, Seattle, Washington, for the Wards Cove Packing Co.; main engine is a 320 hp. Atlas Imperial marine Diesel.

THE first Canadian West Coast fishing craft to be equipped with twin main engines is the 72-ft. seiner-packer *Brooks Bay II*, Nootka-Bamfield Co., by Sterling Shipyards, Vancouver, B. C. Engines are 100 hp. Murphy Diesels with Twin Disc gears, Wheelco pyrometer.

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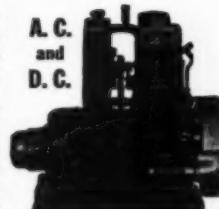
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MIKE TORRENTE, Monterey, California, has ordered a 70-ft. purse seiner from the Puget Sound Boat Building Co., Tacoma, Washington. Named *Vagabond*, the main engine is a 400 hp. Enterprise Diesel and the auxiliary is an 80 hp. Caterpillar Diesel.

SALES are reported by Lorimer Diesel Engine Co., Oakland, California, of a pair of 100 hp. Diesels to Puntaranas, Costa Rica, and a single 45 hp. Diesel to Papeete, Tahiti, all for fishing vessels.

CATERPILLAR Marine Diesels have been installed by San Francisco boat yards—Martino-Lich in the *Titanic*, and Giuseppi Messina in his hook-and-liner. Both are 60 hp.

BUILT to operate in Alaska waters by Maritime yards, Seattle, Washington, the 86-ft. power scow *Robert S* has two 150 hp. Murphy Diesels giving the 200 gross-ton craft a 9½ knot speed.

NAMED *City of Los Angeles*, John Grgas' new Colbert-built (Stockton, California) 87-ft. purse seiner is powered with a 400 hp. Atlas Imperial marine Diesel with a Caterpillar 60 hp. Diesel as auxiliary; pumps are F-M; speed is 11 knots light.

OF the general utility type, the McKenzie Barge and Derrick Co., Vancouver, B. C. are constructing an 80-ft. tug for the Canadian government. Main engine is a 400 hp. Enterprise Diesel and auxiliary is a Cummins.

FISH demand increases cannery tender construction and the Everett Marine Ways, Everett, Washington, is building a 78-footer, for the Uganik Fisheries Co., with 250 hp. Atlas marine Diesel.

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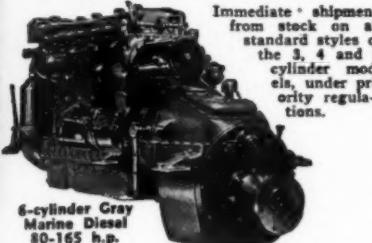
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ANOTHER Atlas Imperial-engined packer just completed is the *W. C. Todd*, also a 78-footer, with a 200 hp. engine constructed by Menchions (Vancouver, B. C.) for Todd and Sons.

THE new Puget Sound ferry, *Harstine II*, designed for beach landings on island run, is powered with 100 hp. Mack "Mariner" Diesel. The 64-ft. craft with capacity of 8 trucks and 40 passengers is expected to do 7 knots.

THE tug *Mystic* of the Upper Columbia River towing Co. is at the Marine Drydock for installation of a 350 hp. Superior marine Diesel and general overhaul.

ANOTHER Columbia River heavy-duty towboat is nearing completion by the Portland Tug and Barge Co., Portland, Oregon. The 80-ft. *Hulda* will have a 320 Fairbanks-Morse marine Diesel and F-M pumps and motors.

THE 45-ft. San Francisco Bay towboat, *Victory*, owned by Les Peterson, is being repowered with a 135 hp. Murphy Diesel with Twin Disc 3:1 gears.

AT Newport Harbor, California, the Peyton Brothers have completed the 50 ft. *Annie Belle* with a pair of 180 hp. Buda Diesels and a 40 hp. Buda Diesel for auxiliaries.

ANOTHER Atlas Imperial marine Diesel installation is by Nunes Bros., Sausalito, California, in the 58 ft. seiner for John Cresci. It is 110 hp.

FOR the San Francisco Towing Co., Anderson & Christofani, San Francisco, California, is constructing 60 ft. river boat with two Caterpillar 115 hp. Diesels and Twin Disc gears.

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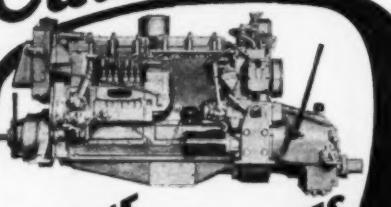
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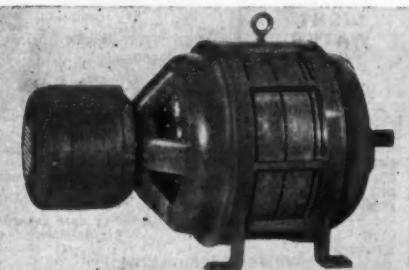
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